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ABSTRACT

Clustered Trade & Industrial Occupations Reading Strategies is one of four instructional guides developed to assist teachers working with students considered disadvantaged because of reading deficiency. Section 1 concerns readability and gives procedures and guidelines for collecting samples. Section 2 briefly describes the Cloze procedure and its usefulness as a reading test and teaching technique. Informal assessment is the focus of section 3. Three informal assessments with sample answer sheets and suggested-approximate answers are provided. Section 4 is an introduction to the guide (sections 5-10) which offers ideas and procedures for integrating reading skills with the occupational content (vocational textbook). Sections 5-8 each present a set of content reading skills: vocabulary skills (recognizing and recording complex information), and study/reading skills. Each skill is divided into segments requiring 5-20 minutes of class time for introduction and practice. Homework uses text assignments normally required. Each section introduces a skill, uses a variety of vocational examples to clarify it, provides exercises to apply and master the skill, and offers teaching suggestions. Section 8 also includes a section on suggested reinforcement activities. Section 9 offers guidelines for making a reading assignment. Section 10 makes further suggestions for reading skills development. (YLB)

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CLUSTERED TRADE & INDUSTRIAL OCCUPATIONS READING STRATEGIES

1981 Vocational Reading Series

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CLUSTERED TRADE & INDUSTRIAL OCCUPATIONS
READING STRATEGIES

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VOCATIONAL READING SERIES

Division of Occupational and Vocational Studies
The Pennsylvania State University

Pennsylvania Department of Education
Bureau of Vocational Education

1981

FORWARD

Education amendments in 1976 (P.L. 94-482) provided for special assistance to a wide variety of students with "special needs." The special needs of these students are derived from conditions of the students which are believed to inhibit success in vocational programs. Both handicapped and disadvantaged individuals are to be served by the legislative provisions.

Academically disadvantaged students are those individuals who, because of math, reading, or communication deficiencies, may not be able to succeed in vocational programs. Legislation has provided for research and development projects to address the needs of these individuals. The projects in progress have been designed to respond to that call for research and development.

This instructional guide was developed for the purpose of assisting Trade and Industrial Occupations Teachers in their work with students who are considered disadvantaged because of reading deficiency. It was developed as a result of vocational reading research at The Pennsylvania State University. The guide was intended to be field tested in selected classrooms in 1981, funded by the Pennsylvania Department of Education.

"Clustered Trade and Industrial Occupations Reading Strategies" have been developed according to certain distinct characteristics of reading requirements in vocational education:

(1) Reading is a vocational skill, one that requires reading abilities that differ from those associated with general literacy.

(2) There is a difference between curricular literature (textbooks and other literature which must be read in the context of student status) and occupational literature (manufacturers instructions, codes, specifications, safety warnings, etc.).

(3) Occupational reading skills are appropriately addressed in the vocational curriculum.

(4) There are strategies available to vocational teachers which need little or no reading specialization.

(5) Available strategies reflect the unique qualities of vocational reading, address general vocational reading skill requirements, and are useful for helping students disadvantaged because of reading deficiencies.

This guide is NOT intended to be envisioned as the final word in reading strategies. It contains examples of several strategies believed to be useful for the vocational instructor seeking methods that are specifically related to trade and industrial occupations instruction. The instructors are responsible for taking these examples and applying them to their occupational specialties. Not all of the methods will work for all trade and industrial teachers or their respective students. The methods were designed to be adapted, not rigidly adhered to.

Companion R & D projects at Penn State provide useful complementary aids. An Employability Skills Curriculum Guide (Wircenski, McPherson, Feng, 1980) is available. That guide addresses socialization, financial management, values clarification, job procurement, and communication skills. Three other occupational clusters (Construction, Business, and Health Occupations) will be the basis for reading strategy guides. These guides will focus more specifically on the respective individual occupational areas utilizing a format similar to the health occupations guide.

Field testing during the 1981-82 year is expected to result in additional refinements of the several reading strategies. Criticism and recommendations are invited by all who receive these materials. Correspondence whould be addressed to:

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L. Jay Thornton, Ph.D.
Project Director
1981

ACKNOWLEDGEMENTS

The Vocational Reading Series, of which this book is one part, has resulted from research conducted by the Division of Occupational and Vocational Studies, The Pennsylvania State University and the Bureau of Vocational Education, Pennsylvania Department of Education. Many people, not expressly identified as part of the project, have served willingly in the dispatch of its objectives. Appreciation is especially expressed to Mr. Wayne Grubb, Consultant for Disadvantaged and Handicapped, Bureau of Vocational Education, Pennsylvania Department of Education, for his support and procedural advice.

Several Area Vocational-Technical Schools in the Center Region of Pennsylvania participated in the development of the series. Scores of manufacturers, publishers, and employers provided literature and information. A listing of the schools, manufacturers, publishers, and employers follows. The project would have been impossible without their help.

Two research efforts provided considerable information toward the development of the series. The first, Basic Reading Skills and Vocational Education, was published by the National Center for Research in Vocational Education under the auspices of the Knowledge Transformation Project. That publication was supervised by Dr. Carol P. Kowle. The second, Review and Synthesis of Reading In Post-Secondary Occupational Education, was published

by Reading In Post-Secondary Occupational Education, was published by the Division of Occupational and Vocational Studies in conjunction with the Division of Education Administration Policy Studies and The Pennsylvania Department of Education. Both titles are available directly from their respective publishers.

Appreciation is expressed to Mrs. Linda Cartright for her careful attention to the typing and proofreading of not only the final drafts of each title in the series, but all the preliminary work and intervening drafts required. The assistance of Edie Johnson, Division Secretary, and Jan Drew, Division Budget Secretary is especially appreciated.

DISCLAIMER

The activity which is the subject upon which this guide was based was supported in whole or in part by the U.S. Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred.

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SECTION I
READABILITY

In order to plan for intervening in situations of reading deficiency, several pieces of information are required. First, it must be known how urgent the need to read actually is, in the context of both curriculum and occupational requirements. This does not suggest that reading, in the general literacy sense, may not be important. Educators clearly recognize that reading ability is crucial if learning is to occur. What this first question addresses is an examination of objectives and their component tasks to ascertain how much reading is required to complete the tasks and, ultimately, the objectives of the course.

Although there has been little research to date to distinguish between curricular and occupational reading requirements it is not difficult to visualize differences between textbook reading and, for example, manufacturers maintenance manuals. Effectively, there are two kinds of reading: that which is required to read the textbooks (curricular) and that required to read the manufacturer's instructions (occupational). Previous research (Thornton, 1977; 1979; 1980; 1981; Thornton, Waters, and Lee, 1980) suggests that there could be significant differences in the readability level of sections of textbooks dealing with specific tasks and the readability level of literature pertaining to the performance of those tasks.

It is a fact that reading literature peculiar to an occupational specialty at least implies that some form of reading is a vocational skill. Thus, the second bit of information must be collected. It must be known (or decided) if the teacher, the school, and the

school district intend to address reading within the vocational curriculum or as prerequisite skill. If reading is to be dealt with in the vocational curriculum, then all students must receive some form of vocational reading instruction. If, however, reading skill is envisioned to be prerequisite then the thrust of reading in vocational settings would be toward dealing with deficiencies. The strategies, in the latter situation, would be individualized and delivered on a case by case basis.

The previous two pieces of procedural information are fairly general; the third and fourth are specific. The third deals with how difficult literature in a specific occupational curriculum is to read. What is the readability level? The fourth deals with how able students are in terms of reading ability. Can students read literature necessary to succeed in a vocational program? We shall deal with these issues separately.

Readability Procedures

Readability procedures are devices to estimate the grade reading level (GRL) of selected pieces of literature. In other words, a readability analysis determines the approximate GRL a person must possess in order to read the literature analyzed. Note the underlining of estimate and approximate. It must be cautioned that, although these procedures have been validated by extensive research, they are not the sole determinants of readability. Muncrief (1975) discussed a variety of other considerations that

are involved in readability assessments. For our purposes of matching literature assessment to student ability an index of readability is a useful measure.

There is a second caution needed about readability procedures. Preliminary results of current research (Thornton, 1981) brings up serious questions about trying to find an average readability level of occupational literature. For example, what does it mean that the average (the word "mean" is normally substituted for the word "average") readability level of a textbook is ninth (9th) grade? Because the word average or mean is used, it can be assumed that some of the literature is higher than ninth and some of it lower. What the average does not tell us is the range of readability levels and the concentration (mode at any level) of readability level.

In order to make sense out of that argument, a little must be known of how readability assessments are done. When analyzing a textbook (or any other lengthy piece of literature) random samples are selected. These samples are analyzed and an average of all of their readability levels is calculated. That average is the mean readability level of the literature. We will get more explicit about how this is done in the next section.

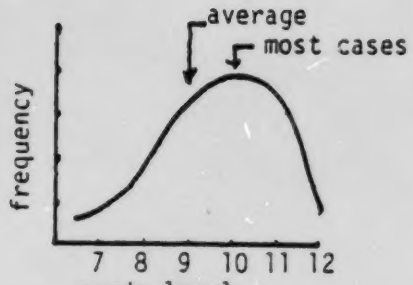
To point out the problem with using the mean (average) some hypothetical samples have been graphed below. The graphs show the curve which would result if the frequencies of grade level of samples were plotted on the graph. The vertical axis of the

graphs represents the frequency that samples were found to be at a particular grade level. The horizontal axis represents the specific grade levels. (See Figure 1)

All of the preceding graphs are of books at the ninth grade readability level. But they all differ in the concentration (mode) of levels. The point here is simply that the mean or average can be a deceptive statistic. The analysis can still be useful, providing the results include the range and distribution of readability scores samples.

Two readability procedures will be discussed: (1) Fry procedure (See Figure 2); and (2) Flesch procedure (See Figure 3).

Figure 1: Sample Readability Graph



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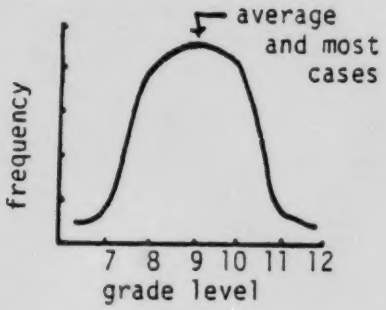

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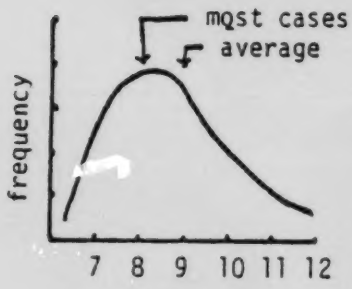

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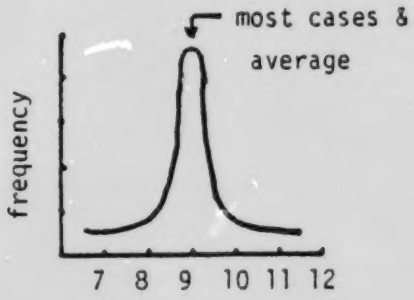

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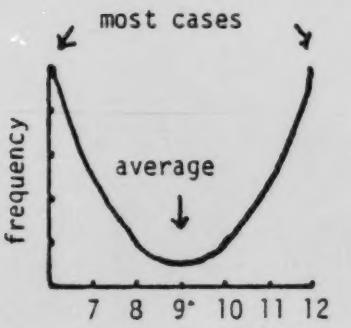
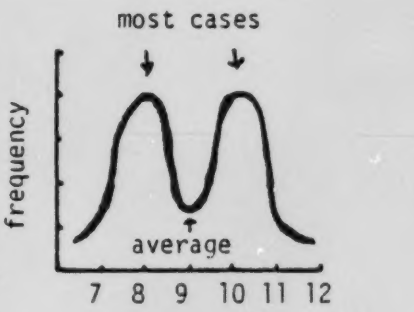


(most cases at highest
and lowest levels)



(most cases one grade
higher and lower than
average)

Figure 2: GRAPH FOR ESTIMATING READABILITY
by Edward Fry, Rutgers University Reading Center, New Jersey
Average number of syllables per 100 words

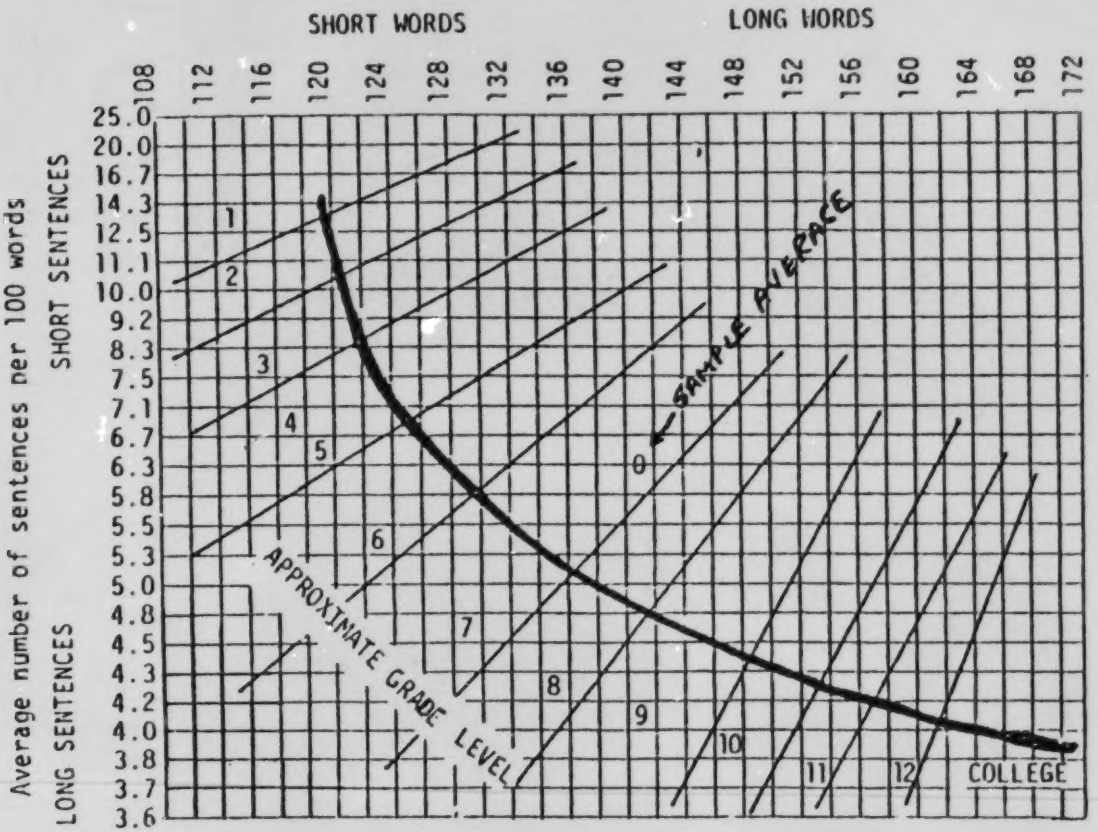


Figure 2 (Continued)

Directions: Use a stratified random procedure, at least five percent for books, more for shorter materials. For example: If a book is 350 pages long, five percent equals 17.5. 350 ÷ 17.5 equals 20. Select a starting number, for example: 6. The first sample page is 6; then 26; then 46; then 66; etc. If one of the pages has no text proceed one page at a time forward until a page is found from which a sample can be taken.

From each of these pages select 100 word passages (alternate positions on page from which taken. For example: beginning, middle, ending). Plot the average number of syllables and average number of sentences per 100 words on the above graph.

This will give you the average readability of the book.

Example:

	Syllables	Sentences
First 100 Words	124	6.6
Second 100 Words	141	5.5
Third 100 Words	158	6.3

Then plot the syllables and sentences for each sample. This will illustrate the range of readability for the literature being analyzed.

(For further information and validity data, see April, 1968 Journal of Reading and March, 1969 Reading Teacher.)

Figure 3: FLESCH READABILITY FORMULA PROCEDURE

There is one readability procedure that is easily used with the assistance of a simple calculator. The Rudolph Flesch (1949) Readability Formula involves a count of the syllables in the sample and words per sentence in conjunction with a mathematical formula. The result is a "Reading Ease Score" which translates into grade reading level.

I. 1. Count the words in the sample (100 words or more, if available).
   2. Count the number of sentences.
   3. Divide the total number of words by the total number of sentences.
   4. Multiply that total (average number of words in a sentence) by 1.015.

II. 1. Count the syllables in the sample.
   2. Multiply the number of syllables by 100.
   3. Divide that total by the number of words in the sample.
   4. Multiply that total by .846.

III. Add I and II.

IV. Subtract III from 206.835.
That is the reading ease score. It translates accordingly:

R.E.Score	Grade	R.E.Score	Grade
115-120	1	80- 89	6
110-114	2	70- 79	7
105-109	3	60- 69	8.5
100-104	4	50- 59	11
90- 99	5	30- 49	14.5
		0- 29	College Grad.

Flesch, Rudolph. The Art of Readable Writing. New York: Harper and Brothers, 1949.

The textbook sample in Figure 4 demonstrates the rules.

Instructions for Calculations

WORD COUNT - Fry: Count all words up to 100 words (may end in partial sentence). Flesch: Count all words up to approximately 100 (end of full sentence).

Numbers - such as 30, 1951, 27-A, L78G are each counted as one word.

Hyphenated words - one word.

Abbreviations - one word.

Acronyms - such as PVA, NSU, USA, AVA are each counted as one word.

SENTENCES - Fry: Count the sentences and determine the tenth of a sentence when ending in a partial sentence. Flesch: Count all sentences.

Headings (paragraph headings) - one sentence

Parenthetical expressions - (enclosed in brackets) is one sentence even if contained in another sentence.

Semi-colon or colon - If there is a semi-colon or colon in what we usually consider a sentence, that is considered to be another sentence. The easiest way to handle that is to count one sentence overall and add one sentence - count for each colon or semi-colon in the sentence.

RECORDING - Fry: Write down the number of sentences per 100 words. In the example the 100th word is "broadcast." There are 9 full sentences, plus the partial sentence ending in "broadcast." There are 14 words up to and including "broadcast" and 21 words

FIGURE 4: SAMPLE WITH WORD COUNT OVER WORDS

1 2 3 4 5 6 7 8
THE ELECTRONIC TUNER PERFORMS THE SAME BASIC PURPOSE

9 10 11 12 13 14 15 16
AS DO PRESENT MECHANICAL WAFER SWITCH OR ROTARY

17 18 19 20 21 22 23
DRUM TYPE DEVICES. HOWEVER, BAND CHANGING IS

24 25 26 27 28 29 30
ACCOMPLISHED BY AN ENTIRELY DIFFERENT METHOD. BEFORE

31 32 33 34 35 36 37
COVERING THE DETAILED OPERATION OF THE ELECTRONIC

38 39 40 41 42 43
TUNER, LET'S REVIEW PRESENT TUNER FUNDAMENTALS.

44 45 46 47
1) FUNCTION AND CONSTRUCTION.

48 49 50 51 52 53 54 55 56
TUNERS SELECT AND CONVERT VHF AND UHF CHANNELS INTO

57 58 59 60 61 62
A COMMON LOW FREQUENCY (INTERMEDIATE FREQUENCY)

63 64 65 66 67 68
SIGNAL FOR EFFECIENT AND ECONOMICAL RECEIVER

69 70 71 72 73 74
PROCESSING. TUNERS GENERALLY CONTAIN THE FOLLOWING

75 76
THREE CIRCUITS:

77 78 79 80 81 82 83
A) HIGH-FREQUENCY AMPLIFIER TO SELECT AND AMPLIFY

84 85 86
EACH BROADCAST CHANNEL.

87 88 89 90 91 92 93
B) LOCAL OSCILLATOR CIRCUIT THAT PRODUCES THE

FIGURE 4 (CONTINUED)

94 95 96 97 98 99 100
NECESSARY MIXING SIGNAL TO CONVERT THE BROADCAST

101 102 103 104 105 106 107
CHANNEL INTO THE COMMON INTERMEDIATE FREQUENCY SIGNAL.

QUINTRIX II TRAINING MANUAL, VOL. 9 ELECTROTUEN. SECAUCUS, NEW JERSEY: PANASONIC COMPANY, DIVISION OF MATSUSHITA ELECTRIC CORPORATION OF AMERICA, P. 2.

in the sentence. Thus there are 9.7 sentences per 100 words. Flesch: Count to the end of the sentence in which the 100th word occurs. Therefore, there are 107 words and 10 sentences. Enter these figures on the form and complete the math involved.

SYLLABLES - Syllables are counted in the same way for each procedure. An easy way is to count only those syllables over 1 for each word. For example:

1 2 3 4 5
The e/lec/tric tun/er per/forms the same bas/ic

Complete the counting for the entire passage in the same manner. Your total then is added to the total number of words (100 for Fry; 107 for Flesch, in this example). That gives you the total syllable count.

RECORDING - Fry: Write down the total number of syllables. On the graph plot the total syllables (across) to the number of sentences per 100 words. That will give you the approximate readability level of that passage. Flesch: Write down the number of syllables in the space on the form and complete the mark as noted. Then add x and y and subtract that figure from 206.835. That is the Reading Ease score and translates to grade level on the chart.

The total sample syllable count and results for Flesch and Fry methods follow in Figure 5.

FIGURE 5: SAMPLE TEXT
WITH SYLLABLES MARKED

THE E/LEC/TRON/IC TUN/ER PER/FORMS THE SAME BAS/IC PUR/POSE AS DO PRES/ENT MECH/AN/I/CAL WAF/ER SWITCH OR RO/TAR/Y DRUM TYPE DE/VIC/ES. HOW/EV/ER, BAND CHANG/ING IS AC/COM/PLISHED BY AN EN/TIRE/LY DIF/FER/ENT METH/OD. BE/FORE COV/ER/ING THE DE/TAILED O/PER/A/TION OF THE E/LEC/TRON/IC TUN/ER, LETS RE/VIEW PRES/ENT TUN/ER FUN/DA/MEN/TALS.

1) FUNC/TIONS AND CON/STRUC/TION

TUN/ERS SE/LECT AND CON/VERT V/H/F AND U/H/F CHAN/NELS IN/TO A COM/MON LOW FRE/QUEN/CY (IN/TER/MED/I/ATE FRE/QUEN/CY) SIG/NAL FOR EF/FI/CIENT AND E/CO/NON/I/CAL RE/CEIV/ER PRO/CESS/ING. TUN/ERS GEN/ER/AL/LY CON/TAIN THE FOL/LOW/ING THREE CIR/CUITS.

A) HIGH/-FRE/QUEN/CY AM/PLI/FI/ER TO SEL/ECT AND AM/PLI/FY EACH BROAD/CAST CHAN/NEL.

B) LO/CAL OS/CIL/LA/TOR CIR/CUIT THAT PRO/DUC/ES THE NE/CES/SAR/Y MIX/ING SIG/NAL TO CON/VERT THE BROAD/CAST CHAN/NEL IN/TO THE COM/MON IN/TER/MED/I/ATE FRE/QUEN/CY SIG/NAL.

NOTE THAT FOR NUMBERS AND ACRONYMS, EACH LETTER (NUMBER) COUNTS AS A SYLLABLE.

The following results were obtained from readability analyses of the preceding sample.

Fry:

100 words

9.7 sentences

202 syllables

No record of this size on chart - Grade may not be inferred, select new sample

Flesch:

107 words

10 sentences

219 syllables

R.E. Score 8.57

Above scale; well above college graduate

Exercise A

Following are three examples selected from other sections of the same literature. Practice the procedure, marking syllables and sentence count directly on the samples.

Exercise A Sample 1

The Process

The flowsheet, shown on the pages 12 and 13 and lay-out, shown on page 23, refer to a medium-sized factory for baby and junior food. In broad lines the various treatments, to which the raw materials are subjected, bear resemblance to those applied in the canning industry, be it that in the baby and junior food sector extra attention is paid to plant cleaning and hygiene. Preferably the raw materials have to be free from insecticides such as DDT, Deldrin, Paration, etc.

Processing techniques are, of course, dependent on processing capacities. For instance, for small quanties of root crop one had better apply carborundum peelers instead of the fully automatic steam peelers shown on the flowsheet. (Stork-Amsterdam, No Date, p. 8)

Exercise A Sample 2

OIL MACHINE THOROUGHLY ONCE A DAY

Clean wax pot frequently and add a little fresh wax occasionally. Old or burned wax will cause thread to break.

Machine must be well heated and wax in wax pot must be in good condition before attempting to sew. Thread rolls must turn freely before making any adjustments on machine. Clean thread rolls with kerosene and oil them thoroughly. Rubber strippers should be replaced if worn out.

I - SETTING OF THE NEEDLE

See cut "c"

To set needle, turn over machine until awl starts to feed; then, adjust needle so that the barb of the needle clears needle guide about 1/16 of an inch.

(Sellari, No Date, p. 2)

Exercise A Sample 3

CARRIAGE CUTOFF OPERATION

Now that the carriage is synchronized with the end of the pipe or tube, enter the cut length and desired quanity of prime pieces into the AutoMate. Press the "Auto" pushbutton and the carriage is now ready for operation. Since "Auto" is permissive to "Line Run," pressing "Line Run" will pick up the carriage main armature contactor and start the mill running. The carriage must also be at home before the mill may start. The carriage will automatically measure the length of the product that passes the measuring wheel. At the appropriate time, based on mill speed, the carriage will accelerate to and match line speed. After the carriage speed is matched to line speed the AutoMate will trigger the cutter to make one cut.

AFTER THE CUTTER RETURNS TO HOME, THEN THE CARRIAGE WILL AUTOMATICALLY RETURN TO THE HOME CARRIAGE POSITION AWAITING THE NEXT CUT CYCLE. (ABBEY ETNA, NO DATE, P. 5)

SAMPLES: HOW SELECTED AND HOW MANY

It is important, if an accurate picture of the literature is to be obtained, that the samples to be analyzed be selected at random. Too many subjective errors would be introduced by merely paging through the book, picking what appears to be representative samples. The easiest way and one that is sufficiently random is entitled a stratified random sampling.

In order to achieve the stratified random sample, it must first be decided how many samples are to be drawn. A useful rule is to select samples from 5% of the pages in the book. Remember, however, that the more samples drawn, the more accurate will be the analysis. That point is demonstrated in the following analyses (See Figure 6) of a trade and industrial textbook under consideration in which 3, 6, 10, 15 were drawn. (Average was used in this case to distinguish between results of analyses in which increasing number of samples were drawn.

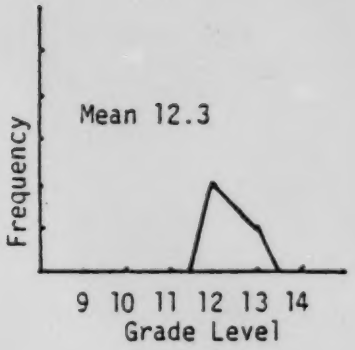
It is recommended that 5% sample or more be drawn for accuracy.

Procedure: Assume a book has 300 pages (not including glossary or index). A 5% sample requires (.05 x 300) 15 samples. To establish the starting page divide the total pages (300) by the total samples required (15). That result is 20. Randomly pick a number from 1-20. This can be done using numbers in a hat. That number is the starting page. Let's assume it is 6. The remainder of the pages are selected by adding 20 to 6, 20 to 26, 20 to 46, etc. until all the samples are drawn.

Figure 6: Sample Graphs of GRL Frequencies: 3, 6, 10, 15 Samples

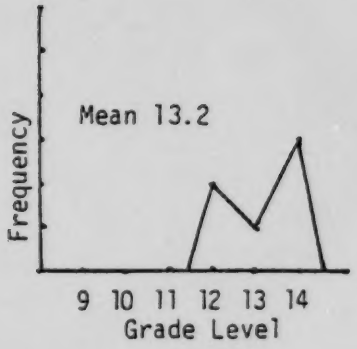
3 Samples

GRL	Freq.
12	2
13	1



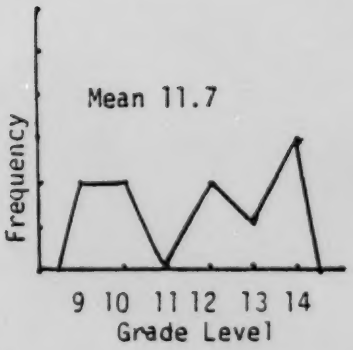
6 Samples

GRL	Freq.
12	2
13	1
14	3



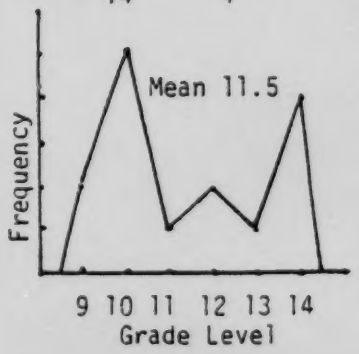
10 Samples

GRL	Freq.
9	2
10	2
12	2
13	1
14	3



15 Samples

GRL	Freq.
9	2
10	5
11	1
12	2
13	1
14	4



Now we know the pages of the book we will use in the analysis. If any of those pages contains no text (some may be pictures or diagrams) move one page at a time forward or backward until text is found. It is also recommended that the sample 100 words be selected alternatively from the beginning (B) and end (E) of the page. Therefore, page 6 would be 6-B (for beginning), page 26-E (for end), page 46-B, etc.

Exercise B

Compute a stratified random sample schedule for the following:

1. Textbook with 350 pages.
2. Textbook with 1000 pages.
3. Textbook with 525 pages.

If the literature you plan to analyze contains less than 200 pages, but more than 25, select 10 samples. For literature of less than 25 pages, but more than 5, select every other page. For literature less than 5 pages, take a sample of every page.

On the following page (See Figure 7) is a form to assist you in recording your findings. It is always a good idea to keep a file of literature analyzed.

Figure 7: Readability Record

Author(s):

Title of Literature:

Publisher:

Publication Data:

Total Number of pages:

Percent of pages sampled:

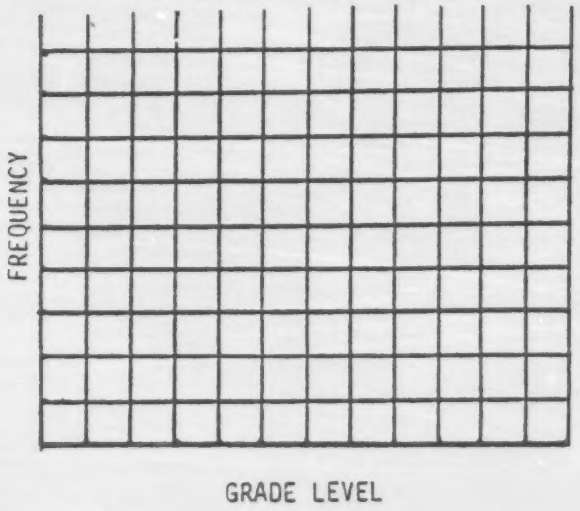
Procedure used:

Page numbers from which samples were taken:

Highest readability:

Lowest readability:

Graph for Plotting Results



(Thornton, Waters & Lee, 1980)

The Problem with Readability Analysis

Earlier it was mentioned that the GRL yield of readability procedures is actually an average (mean). In order for the mean to be an appropriate measure, certain conditions must be met. For example, the range must be closed; there must be a beginning and an end.

Readability yields are not based on a closed range. They begin at an arbitrary point, such as grade one, and end at another arbitrary point, such as grade 16. Reading occurs before grade 1 and after grade 16, but there are no levels to accommodate that reading. So, the mean is, by definition, inappropriate.

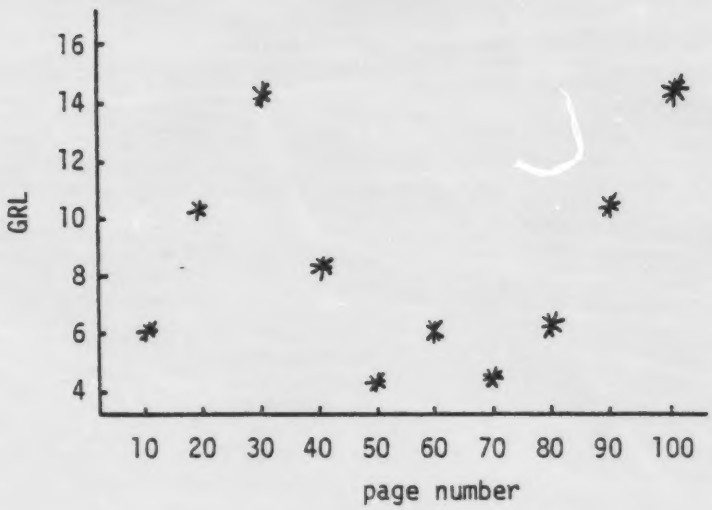
Another problem exists which is more devastating then statistical theory. Readability means assume unimodal distribution and no serious skew. Research attendant to the project (Thornton, 1981) demonstrated that occupational literature is seldom unimodal and, when it is, the distribution is often seriously skewed.

Moving away from statistical talk, what the research found was (1) GRLs were clustered at more than one level, such as at the 10th grade and 14th grade, and (2) when not clustered at more than one level, they contained extreme values which distorted the mean. The result of these conditions is that to report the average grade reading level of a health occupations textbook is nearly useless.

Assume for a moment that a publisher claims a book to be at the 10th grade reading level. What do you now know? Not much! First, readability formulas are accurate to about 1½ grades. Thus a 10th GRL really means 8½ to 11½. Second, the study referred to previously found standard deviations of 2-3 years. So the spread around the mean of 10 is plus or minus 2-3 years. Thus, considering the spread, the information found in a reported 10th GRL, is even more vague. The low end could actually be 5½ and the high end 14½. There is no way to tell.

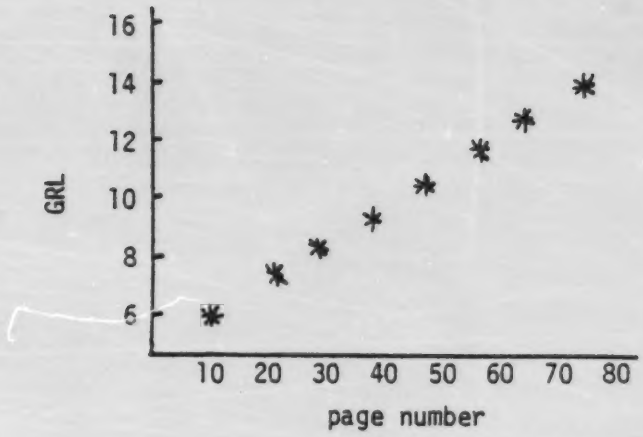
The statistical irregularity can be overcome. Instead of reporting an average GRL, you need to plot the sample GRLs in terms of page numbers in the text analyzed. Actually, this is easier than computing all the statistics mentioned above.

For each sample taken from a textbook plot the results on a graph with the horizontal axis representing page number in the text and the vertical axis being the GRL of that sample. The results would look like the following graph:



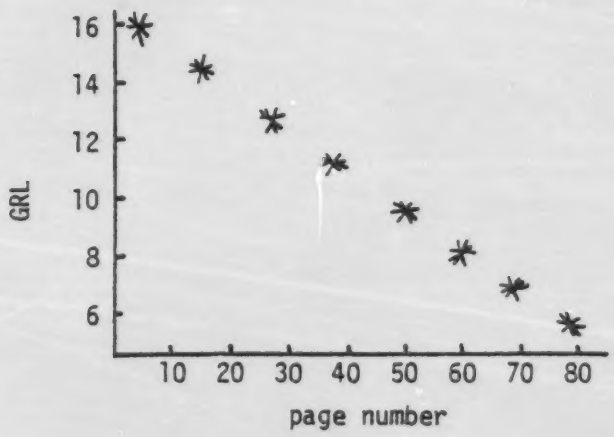
If you know your students have an approximate 8th grade ability, this graph demonstrates that at pages 20, 30, 90 and 100, they will probably have difficulty. The more samples you use, the more specific your information will be. At the problem points, you can intervene with the strategies to be discussed in this guide.

This method of analyzing a text accomplishes something else. Ideally, a textbook should begin at a reasonably low level and proceed to a reasonably high level. So a graph of the results should look like the following graph:



If the graph resulting from your analysis does not show progressive difficulty, the textbook may not be appropriate.

Lets say the graph shows the highest GRL at the beginning and decreasing difficulty thereafter:



Reading deficient students would be faced with the most difficult reading at the first contact with the book. When that happens, many students give up. The book is inappropriate.

It is possible that you have no choice and must use a textbook that is difficult at varying points. In that case, with the graphed reporting procedure, you will know about the difficulty and where it exists you can intervene. The mean GRL simply does not give this information.

Very few graphs will result in perfect lines, such as those shown. You must look for a trend; then you must account for any extremes. In any case, the graphed procedure permits locating potential problems.

SECTION 2
CLOZE PROCEDURE

STUDENT READING ABILITY

Diagnostic reading test scores are often available for students in vocational programs. These scores, normally on file at the home school (in the counselors office at the comprehensive high school), are useful indicators of a student's general reading ability. How well they relate to vocational reading requirements is subject to conjecture. There simply has not been a concerted effort to separate vocational reading skill from general literacy skill. Because of these unknowns it is strongly recommended that you not accept a GRL score as final. Standardized reading test scores are useful indicators, but they should be supplemented with teacher made vocational reading tests.

A useful and highly adaptable reading test is the cloze procedure.

> The cloze procedure is an objective measure of language correspondence between reader and writer. It consists of a cloze (word) unit, a single occurence of a successful attempt to reproduce accurately a part deleted from a message, by deciding from the context that remains what the missing part should be (Taylor, 1953).

> The cloze procedure differs from vocabulary contextual texts. Rather than choosing omitted words because of definition and purpose, the cloze units are chosen mechanically; every fifth word, for example, occurring at any point in a continuous passage is omitted. The cloze design incorporates control against misrepresenting strength/weakness in content vocabulary as an indication of the test subject's ability/inability to read (Thornton, 1979).

Any piece of literature can be clozed. That includes textbooks, occupational literature, safety messages, codes, medical contraindications, literally anything. The procedure is described below:

1. Select a piece of literature.
2. Leave the first sentence intact.
3. Delete every fifth word.
4. Leave the last sentence intact.
5. Instruct the student to read the entire passage first, then begin filling in the blanks.
6. Instruct the student to be aware when guessing is the rationale for word selection, but to guess when other rationale fails.

Scoring the test is accomplished as follows:

0-39.9% Frustrational level (Student will not be able to read the literature)

40.0-69.9% Instructional level (Student will require intervention to be able to read the literature)

70.0-100.0% Independent level (Student is able to read the literature without intervention)

On the following pages two different cloze tests have been prepared using on-the-job literature. The correct words which have been deleted are listed following each example.

Figure 8: Metal Fabrication
Cloze Test

RESTRIKE

To obtain a consistent backbead contour at the tie-on a hot start mechanism is helpful. When a "hot start" _____ not available, the following _____ may produce acceptable results.

1. _____ at the leading edge _____ the crater.
2. Push the _____ back into the puddle, _____ it there for a _____ time to "cook" out _____ slag that may be _____ between the backbead and _____ ceramic.
3. Move to the _____ edge of the puddle _____ progress as normal.

Restriking _____ the bead is still _____ or a quick grinding _____ the crater to a _____ edge will also help _____ tie-in.

FIGURE 8 (CONTINUED)

POSITION

THE ANGLE _____ THE ELECTRODE HAS A _____ ON THE UNIFORMITY OF _____ BACKBEAD. WITH PRACTICE, THE _____ WILL DETERMINE THE ANGLE _____ PROVIDES BEST RESULTS. THE FOLLOWING ILLUSTRATIONS FURNISH A STARTING POINT.

(CHEMETRON CORPORATION, 1980, P. 6)

FIGURE 8 (CONTINUED)

WORD LIST

IS	AND
PROCEDURE	WHILE
RESTRIKE	RED
OF	OF
ELECTRODE	FEATHERED
HOLDING	THE
SUFFICIENT	OF
ANY	BEARING
TRAPPED	THE
THE	WELDOR
LEADING	WHICH

FIGURE 9: SHOE REPAIR
CLOZE TEST

TIPS FOR ADVERTISING ATHLETIC FOOTWEAR REPAIR

MASTERING THE TECHNIQUE OF _____ FOOTWEAR REPAIR ENSURES THAT _____ PREPARED TO FIX THIS _____ OF FOOTWEAR. BUT ALL _____ PREPARATION IN THE WORLD _____ HELP YOUR BUSINESS IF _____ DON'T KNOW THAT YOU _____ PERFORM THIS SERVICE.

A _____ OF SHOPS HAVE ACHIEVED _____ BUSINESS THROUGH THEIR ADVERTISING _____ ATHLETIC FOOTWEAR REPAIR. THE _____ PLACE TO BEGIN IS _____ YOUR SHOP AND IN _____ WINDOWS. PREPARE A SIGN _____ DISPLAY IT PROMINENTLY. ALSO, _____ HESTITATE TO TELL YOUR _____ THAT YOU OFFER THIS _____ SERVICE WHEN YOU TALK _____ THEM.

CHURCH BULLETINS AND LOCAL _____ ARE A GOOD PLACE _____ YOUR ADVERTISING. PLACE AN _____ IN THE SPORTS SECTION OF THE NEWSPAPER FOR GREAT _____.

FIGURE 9 (CONTINUED)

THE CLASSIFIED PAGES OF _____ TELEPHONE DIRECTORY ARE A _____ METHOD OF ADVERTISING. START _____ LISTING OF "ATHLETIC SHOE _____." THAT WAY PEOPLE WILL SEE YOUR AD AUTOMATICALLY WHEN THEY LOOK UP "ATHLETIC SHOES."
(SHOE SERVICE . . ., 1978, P. 8)

FIGURE 9 (CONTINUED)

WORD LIST

ATHLETIC	OF	NEWSPAPERS
YOU'RE	OBVIOUS	FOR
TYPE	INSIDE	AD
THE	YOUR	OF
WON'T	AND	RESULTS
CUSTOMERS	DON'T	YOUR
CAN	CUSTOMERS	GOOD
NUMBER	NEW	A
REMARKABLE	WITH	REPAIR

Exercise A

Cloze the following passage and write out the instructions to the student regarding how they should proceed.

INTRODUCTION

We learn by experience. Learning safety through personal experience, like a child touching a hot stove is harmful, wasteful, and unwise. Let the experience of others teach you.

Safe practices developed from experience in the use of welding and cutting are described in this manual. Research, development, and field experience have evolved reliable equipment and safe installation, operation, and servicing practices. Accidents occur when equipment is improperly used or maintained. The reason for the safe practices may not always be given. Some are based on common sense, others may require technical volumes to explain. It is wiser to follow the rules.

Read and understand these safe practices before attempting to install, operate, or service the equipment. Comply with these procedures as applicable to the particular equipment used and their instruction manuals, for personal safety and for the safety of others.

Failure to observe these safe practices may cause serious injury or death. When safety becomes a habit, the equipment can be used with confidence.

These safe practices are divided into two Sections: 1 - General Precautions, common to arc welding and cutting; and 2 - Arc Welding (and Cutting) (only).

Reference standards: Published Standards on safety are also available for additional and more complete procedures than those given in this manual. They are listed in the Standards Index in this manual. ANSI Z49.1 is the most complete.

The National Electrical Code, Occupational Safety and Health Administration, local industrial codes, and local inspection requirements also provide a basis for equipment installation, use, and service. (Miller, 1980, p. 1)

Exercise A: Answer Sheet

Instructions:

Words List:

The cloze procedure can also be used as a teaching technique. A variety of cloze modifications are useful for vocational teachers.

The changes in the procedure reflect the purpose of the exercise. If, for example, an occupational instructor wishes to highlight series wiring for trailer brakes and be certain that the student reading the literature understands what is being read, the passage can be "clozed," deleting those words which are critical to the comprehension. The following trailer wiring passage with "instructional modification" words (to be deleted) underlined illustrates the technique:

> SAMPLE: INSTRUCTIONAL MODIFICATION CLOZE
>
> TRAILER BRAKES. Next in the circuit are the Trailer Brakes themselves. Brakes are wired in parallel, never in series. This is necessary for proper operation. Series wiring, with current flowing through one brake and then the other, is not advisable for two reasons: (1) in series wiring an electrical failure in one brake will cause the other to fail also; and (2) in series wiring, each component through which current flows "drains off" some of the current available to other components and affects their efficiency. Parallel wiring provides each brake with its own individual power supply. (Phillips Industries, 1977, p. 5)

Another modified cloze teaching technique is the "lexical cloze." Lexical is defined as relating to words of a language. The lexical cloze involves deletion of words according to the kinds of words they are, such as nouns, verbs, adjectives, etc. A later segment of this article develops case grammar modifications utilizing the lexical cloze, establishing applicability for

occupational education reading intervention. The example which follows illustrates use of verb deletions in an engraving machine application. The words to be deleted have been underlined:

HOW TO SET DEPTH

1. See that nose is properly seated in spindle recess and tightened.
2. Clamp a piece of flat material in workholder.
3. Insert cutter into spindle counter clockwise and loosen screw in cutter head (R) with wrench.
4. Open lock screw (S) and set micrometer sleeve to zero.
5. Bring spindle down so that nose touches surface of the clamped material.
6. Lightly tap cutter down so that it touches surface of material
7. Now lock screw in cutter head.
8. Nose and cutter point are now at zero setting. Then turn micrometer sleeve to desired depth.
9. Check whether clearance hole in regulator nose is large enough to allow cutter point to rotate freely. Rotate spindle manually before starting motor. If cutter point is rubbing, change to nose with a larger hole. (New Hermes, Inc., 1977, p. 7)

Note that only the verb's involving an action on the part of the student have been marked for deletion. It is the activity that is emphasized in this reading intervention exercise.

When used as teaching technique, the cloze procedure is easily adapted to provide for increasing degree of difficulty. Often vocational students have experienced a history of failures in reading. The pattern is conducive to diminished motivation in an attempt to read. In order to break the pattern of reading successes is useful. Literature of any level of readability can be clozed. Thus, vocational literature at a low readability level can be used for those students who need a success stimulus. In addition, for teaching purposes, synonymous or words close to the correct word can be accepted. The number of clozed words can be decreased instead of following a schedule. The next example illustrates this point:

> PROCEDURE:
>
> Wear-O-Matic 12--7/64" diameter electrode should be deposited with the open arc only, using direct current, reverse polarity. The recommended amperage range is 175-300 amperes at 30-35 arc volts. A weaving technique is recommended to develop maximum abrasion and impact resistance. Application thickness should be limited to two passes or 1/4". (Chemetron, 1978, p. 17)

For the word "abrasion," the student would be correct inserting "friction," for example. Note that only three deletions have been made and all are heavily clued.

CASE GRAMMAR AND THE CLOZE PROCEDURE

Gibson and Levin (1979) describe Fillmore's theory of case grammar. ". . . which imaginatively combines syntactic and semantic features." The study of meanings (semantics) and the orderly system of words (syntax) combine in Fillmore's Case Concepts (Brown, 1973). The theory of case grammar is easily adapted to teaching techniques using the cloze procedure. The following illustrations from Electricity and Electronics (Gerrish and Dugger, 1977).

Agentive (A) - "The typically animate, perceived instigator of action."

The scientist tells us that everything is made up of matter (p. 7).

Instrumental (I) - "The inanimate force or object casually involved in the state or action named by the verb."

A negatively charged mass will be attracted by a positively charged mass (p. 9).

Dative (D) - "The animate being affected by the state or action named by the verb."

Every young man is familiar with the story of Benjamin Franklin and his kite (p. 15).

Factive (F) - "The object or being resulting from the state or action named by the verb."

The student may construct several voltaic cells to demonstrate this action (p. 15).

Locative (L) - "The location or spatial orientation of the state or action named by the verb."

This type (capacitor) is found in the power supply of radio transmitters and other electronic equipment (p. 99).

Objective (O) - "The semantically most neutral case: anything representable by a noun whose role in the state or action named by the verb depends on the meaning of the verb itself."

This kind of capacitor (electrolytics, can type) employs a different method of plate construction (p. 99).

Benefactive (B) - "A noun deriving benefit of the action of the verb."

The main advantage (to tubular electrolytics) is the smaller size (p. 99).

Comitative (C) - "In accompaniment."

As the motor armature rotates, the current in the armature windings is periodically reversed due to commutator action (p. 131).

Temporal (T) - "When the verb is accomplished or occurs."

No current will pass through the diode when the plate is negative in respect to the cathode (p. 167).

Modified cloze techniques can be used as introductory exercises, included in self-instruction packets, adapted for games, or structured for remedial work. They provide an excellent method of coordinating in-class vocational work and English or remedial reading treatment.

Exercise B

Underline each word in the following passage which could be clozed by Fillmore rules, entering above the word the letter which indicates the rule used.

An MPU Self-Test occurs on power-up. Positioning the ON-OFF switch on the game to the "ON" position initiates the test. Successful completion of the test is indicated by seven flashes of the LED (Light Emitting Diode) on the module. Figure A4-1 directs the serviceman to the proper entrance point in the diagnostic table for less than seven flashes. It is necessary to read, understand, and follow the procedure step-by-step until a cause for the problem is determined and the remedy for the problem, as given in the procedure, is put into effect. The few minutes spent to read and understand the procedure will prevent problems and save time later.

During certain steps in the procedure, it is necessary to determine the condition of the address, data & read/write lines (bus). Each line is examined for the following faults: Inputs 'stuck' high or low (shorted to ground), shorts to adjacent leads and continuity between devices on the bus. The procedure also examines the status (good or failed) of several decoding integrated circuit inverters, buffers and gates on the A_g-A_{12} address lines. To accomplish this testing with the use of a voltmeter, bus lead connection points are provided by means of J5. Continuity between

devices on the bus is ascertained by the use of Table A4-1 (or the schematic) and a voltmeter. (Module and Component Replacement. Bally Electronic Pinball Games Repair Procedures. Bensenville, Illinois: Ba-ly Manufacturing Corporation, June 29, 1978, p. 25).

SECTION 3
INFORMAL ASSESSMENT

INFORMAL ASSESSMENT

Prior to the instruction of reading skills with the occupational literature, it is important to know your students' current reading performance. A standardized test is useful as a general screening device and yields composite scores in major skill areas -- e.g. vocabulary and comprehension. Another instrument is needed, however, to assess specific skills within the major skill areas -- e.g. contextual analysis, main idea, cause-effect relationship. The development and use of an informal assessment can meet this need.

Procedure

A. The first step in the development of an informal assessment is the establishing of a hierarchy of critical reading skills in which vocational students should show competence. The skills presented, for example, in this text have been determined as important for effective reading in the vocational materials. Also, the needs of your specific student population must be considered.

B. After determining the skills to be measured, then an order or matrix within each major skill area must be developed. The more reasonable order is proceeding from easy to more difficult.

C. Then the informal measure is designed based on the criteria in items A and B. Extractions from materials (textbook and manufacturer's) to be used in the occupational program

should be used in constructing the questions. Therefore, the questions require practical application of skills with materials students need to read and understand in class. The assessment becomes "tailor-made" to your course.

D. It is helpful to design pre and post assessments with similar levels of difficulty, and which measure the same skills in the same order -- two instruments that are as parallel as possible. These can be compared for program effectiveness and for evaluation of improvement of students' reading skills in your occupational area.

Purpose

The use of the informal reading skills assessment can accomplish three purposes for the vocational teacher:

A. It can be utilized as an identification procedure. After students have taken the assessment, you can recognize more clearly those students whose reading skills are noticeably inadequate. This measure helps you to identify the disadvantaged learner. If a student performs poorly on much of the assessment, he/she will probably have difficulty with your assigned vocational reading materials.

B. It can be utilized as a diagnostic procedure to determine which reading skills will require special attention in your instruction. After the assessment is scored, you

will be able to select those questions which were more frequently missed and identify the specific skills in which students are showing most difficulty.

C. It can be utilized as an evaluation procedure with vocational students growth (both group and individual) in reading skill preformance. This can best be accomplished by using pre and post measures of the assessment. This pre and post testing can be used with a total skills program or can be done with skill segments. The results will be useful to the teacher for evaluating student progress and program effectiveness. The results can be also used as supportive data for reporting course or program success.

Administration

The informal assessment can be administered once or parallel tests can be given for a pre and post testing situation. A pretest is given before instruction and student practice, followed by a parallel posttest. As mentioned previously, the pre and post measures allow for comparison, and student progress and program effectiveness can be more completely evaluated. A single administration can also be beneficial as discussed in the "purpose" section. The results can be used for identification of disadvantaged learners, for identification of skills to be emphasized in instruction, and for information regarding students' reading performance.

Scoring and Reporting

Since the assessments are designed specifically for your program and they are not standardized, the scores can be reported in percentages (number correct divided by number possible). Each item should be assigned a point value with the total equaling 100. The results are best utilized when this is done for each of the major areas -- vocabulary, comprehension and study skills.

Students should be given their scores so they recognize their own reading skill performance. A short reporting form with raw score and percentage provides good record for the student; individual skills tested with a raw score breakdown could be included to provide more specific information.

If you utilize a pre and post testing program, results can be reported in various ways. Students can be given both sets of scores for comparison and evaluation of growth. Data can be recorded to show program performance by: (1) listing all students raw and percentage pre and post scores together in chart form; (2) determining "percentage improvement" by students and recording in table form. An example of item 2 could be:

Comprehension - Test 2 (This can be done for each major area.)

1) 33 possible items

2) Approximate time: 30 minutes

3) Content: Paragraph subject, supporting ideas, main idea, graphics

4) Results: 113 of 129 students showed improvement

Amount of percentage gained from pre to post score	Number of students
1 - 10%	36
11 - 20%	35
21 - 30%	20
31 - 40%	13
41 - 50%	7
50+	2

Scoring the assessments and reporting the results is helpful in many ways. Students can visually see reading performance. You, as vocational teacher, can determine which reading skills need emphasis. Plus, student and program performance can be more clearly seen.

Assessments

Following are three informal assessments, one for each of the major skill areas. Excerpts of occupational literature from varied trades have been utilized. It has been designed so that it can be given to all vocational students, even with the varied occupational material. Critical reading skills for vocational literature have been determined and they provide the structure for the three assessments.

The informal assessments (vocabulary, comprehension, study skills), can be administered as they are, or they can be used as models for your own construction of informal assessments. Sample answer sheets are also included. Plus, suggested "question-weight" is given, according to difficulty of task. This is a guideline; you may devise your own point system.

ASSESSMENT ONE -- VOCABULARY

This activity will help you to measure your present vocabulary performance. Answer as accurately as possible. Please record all responses on the provided answer sheet.

A. Formal Definitions (2 points each definition)

Directions: The following exercise measures your ability to determine the meaning of a word by understanding the formal definition given. Write a definition for each underlined word.

1.) A vocation is a job for which a person is specially trained.

2.) Face-to-face listening, listening done as part of a two-person conversation, and listening done as a member of a small group are all referred to as small-group listening.

3.) Since the goal at this stage of construction is to enclose the structure and make the roof watertight, only those partitions that support the ceiling and/or roof (bearing partitions) are usually installed.

B. Synonyms (1 point for each answer - 7 points total)

This section will measure your ability to determine meaning of a word by locating synonyms -- one word or a small phrase which has a similar meaning and which serves to explain. Write that single word or phrase which is a synonym for the underlined word(s).

1.) One must understand the system to accurately diagnose (identify) mechanical difficulties.

2.) Carbohydrates are classified as monosaccharides, or simple sugars, when they contain one basic sugar unit ($C_6 H_{12} O_6$).

3.) The surface many spall (chip or crumble away) if subjected to moisture and freezing.

4.) Pick out the terms and the appropriate synonyms in this paragraph:

When these lines of force encounter a longitudinal (lengthwise) crack, they lean through and become points of surface attraction for the magnetic powder dusted on the surface. A transverse, or crosswise crack, would not show because the lines of force would be parallel with the crack.

C. Inferential Clues (3 points each definition)

This section will require you to use clues from the surrounding context to determine the meaning of an unfamiliar term. Write a definition for each underlined word by using the clues within the paragraph.

1.) Early Ambulation. It is common practice to get the patient out of bed hours after surgery, instead of keeping him in bed for prolonged periods, which adds to his discomfort and delays his recovery . . . You should remain with the patient the first few times that he is out of bed. Assist him to dangle his feet at the side of the bed for a few minutes so that his circulatory system can adjust to his change of position. When he no longer feels dizzy or light-headed, assist him to stand, take a few steps, and sit in a chair. In the postoperative orders, the patient's doctor will specify when the patient is to be ambulated, how often, for how long a period of time, and with what, if any, limitation.

2.) In planning interior display it is necessary to take into consideration a whole interior and not just an individual display. In order to obtain a harmonizing effect from displays, the interior planning should include decorations, layout, and merchandise displays. Decorations include the lights, fixtures, walls, ceiling and floors. The layout involves the placement of the tables, showcases, racks, and other equipment. The displays involve the actual placing of merchandise on the counters, the floor, the shelves, and in showcases.

3.) Before repainting, the probable cause of the trouble should be ascertained. If it is due to springtime blistering on localized areas on the house in the colder northern states, a more effective vapor barrier is needed. This can be obtained by painting the indoor side of the exterior walls. Two coats of

aluminum paint plus two coats of decorative paint are best for sand-finish plaster. On smooth plaster, a primer-sealer and at least one coat of semigloss paint make a good barrier. Shutting off humidifiers will also help.

4.) For this paragraph, define the underlined word, and list the words of phrases (clues) which helped you to understand the meaning of that word.

Sedation is used for the dental patient to relieve apprehension and fear. The techniques and drugs used do not render the patient unconscious, and their protective reflexes remain intact. The patients, at proper levels of administration, will respond to commands by the dentist and assistant and are able to cough, swallow, breathe, and maintain all physiologic functions at reduced levels.

D. Illustrations (3 points each definition)

The next questions will measure your ability to define words through the use of drawings and photographs.

1.) Look at the drawing carefully. What is the meaning of gesticulating?

The gesticulating speaker communicates her own nervousness.

2.) Use the drawing and the paragraph from a textbook on machining to determine what parallels are.

Parallels, Figure 7-36, can be made from standard steel shapes or from special steel that is heat treated. The heat treated steel is then ground to size. Parallels are helpful for raising work in the vise so drilling can be better observed. Parallels must be located so the drill does not come in contact with them when the drill breaks through.

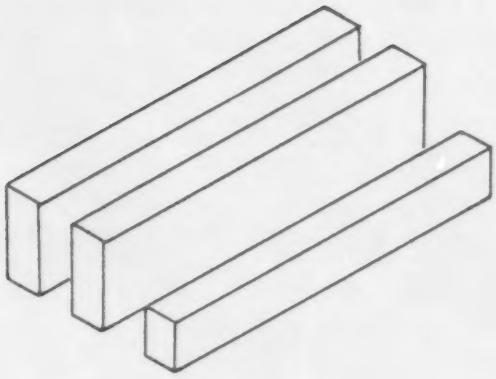
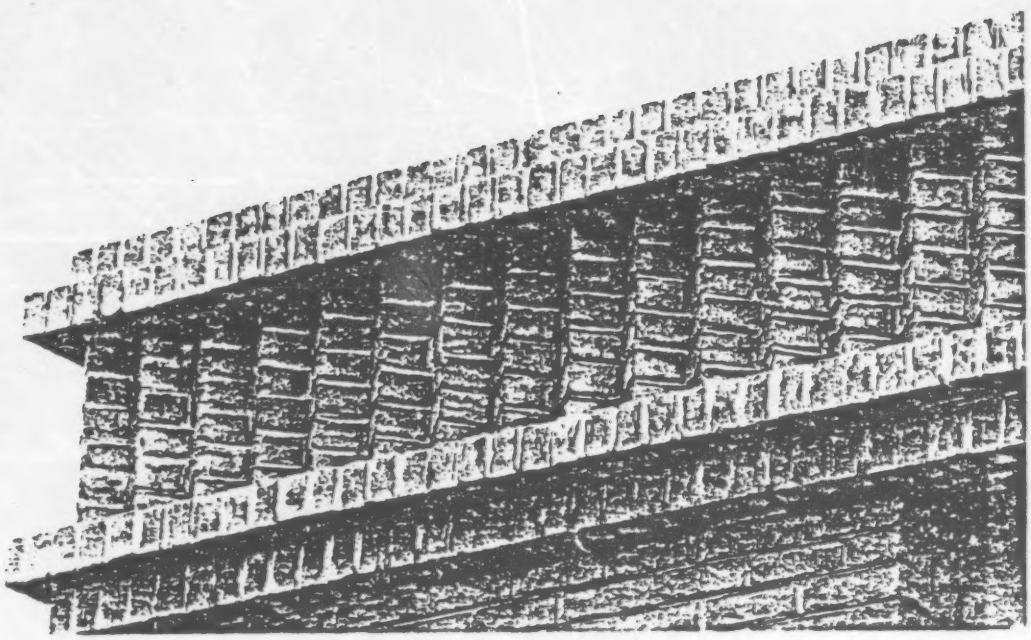


Fig. 7-36. Steel parallels.

3.) Look at the following photograph carefully,
What is brick corbelling?



E. Content Vocabulary (4 points each paragraph)

The following section will require you to recognize content vocabulary words. Read each paragraph and list on your answer sheet those words or phrases specific to the given occupation (A) that you would need to know to understand the reading material, and (B) that are common to that occupation.

1.) Occupation: Food Preparation

Originating in many different parts of the world, spices, herbs, and other flavoring agents are parts of plants, flowers, or complete agricultural products, used to add zest to a dish. Although they often were used in the past to mask a taste generated by spoilage or decay of a food, they are presently used (in most cases) to enhance the flavor of a culinary work or to give unusual stimulation to a traditional dish.

2.) Occupation: Welding

The single-bevel T-joint is able to withstand more severe loads than the square T-joint. It can be used on plate thicknesses ranging from 3/8 to 5/8 inch. Plate of greater thickness can be welded with the submerged arc process. Cost of preparation is greater than for the square T-joint, and fitup is likely to take longer. Electrode costs are less.

3.) Occupation: Business/Management Tactics

A lockout is a temporary work stoppage by an employer in an attempt to win a dispute with the employees. In a sense, a lockout is a strike by the employer against the employees because management "locks the gates" and refuses to let workers enter the business. The lockout cannot be used as a device to discourage employees from joining or forming a union, although it was used extensively for that purpose prior to the passage of certain laws. Today employers seldom close their businesses in order to pressure employees to negotiate even though they have the right to do so.

*This assessment has been assigned 49 points. To facilitate scoring, it is suggested to award the extra point to each student or to devise a one-point item.

ASSESSMENT ONE -- VOCABULARY

SAMPLE ANSWER SHEET

Name _____ Date _____

A. Formal Definitions

1.) _____

_____

2.) _____

_____

3.) _____

_____

B. Synonyms

1.) _____

2.) _____

3.) _____

4.) Term _____ Synonym _____

5.) Term _____ Synonym _____

C. Inferential Clues

1.) What is early ambulation? _____

_____

_____

2.) What is interior display? _____

_____

_____

3.) A. What does ascertained mean? _____

_____

B. What is vapor barrier? _____

_____

_____

4.) A. What is sedation? _____

_____

_____

B. List the clues: _____

_____

_____

D. Illustrations

1.) Gesticulating: _____

_____

_____

2.) Parallels: _____

_____

_____

3.) Brick Corbelling: _____

_____

_____

E. Content Vocabulary (You may list in 2 columns.)

1.) Food Preparation:

2.) Welding:

3.) Business/Management Tactics:

VOCABULARY ASSESSMENT

SUGGESTED - APPROXIMATE ANSWERS

A. Formal Definitions (Answers should be close to these.)

1.) vocation - job for which a person is specially trained.

2.) small-group listening - includes face-to-face listening, listening in a two-person conversation, and listening in a small group.

3.) bearing partitions - those partitions that support the ceiling and/or roof.

B. Synonyms (Answers should be exact.)

1.) (diagnose) - identify

2.) (monosaccharides) - simple sugars

3.) (spall) - chip or crumble

4.) A. longitudinal - lengthwise
B. transverse - crosswise

C. Inferential Clues (Answers will vary but same main point should be included.)

1.) early ambulation - having the patient out of bed and walking a few hours after surgery.

2.) interior display - includes planning for the inside of an entire space, and the decorations, layout and merchandise displays should be coordinated.

3.) A. ascertained - determined or understood
B. vapor barrier - that process which keeps out the moisture

4.) A. sedation - techniques and drugs used by dentists to calm a patient and to relieve pain that are safe and reasonable for patient.
B. Clues:
- to relieve apprehension and fear
- do not render patients unconscious
- protective reflexes remain in tact
- patients will respond to commands
- patient can maintain physiologic functions at reduced levels

D. Illustrations (Answers will vary but main points should be similar.)

1.) gesticulating - gesturing or using the hands and body to communicate ideas to your audience.

2.) parallels - heat-treated steel that is ground into rectangular bars of various sizes, according to need. They are useful during drilling for raising work in the vise.

3.) brick corbelling - bricks which form a shelf or ledge that are arranged in tight rows going across with corners exposed. Two rows of brick border the top and bottom of this arrangement which appears to be a strong construction.

E. Content Vocabulary (Answers may vary slightly.)

1.) Food Preparation:

spices
herbs
flavoring agents
agricultural products
spoilage or decay
enhance the flavor
culinary work
traditional dish

2.) Welding

single-bevel T-joint
square T-joint
plate thicknesses
submerged arc process
fitup
electrode costs

3.) Business/Management Tactics:

lockout
temporary work stoppage
employer, employee
strike
management "locks the gates"
union
negotiate
pressure

ASSESSMENT TWO -- COMPREHENSION

A. Paragraph Subject (2 points each)

Directions: This section will measure your ability to recognize the subject of the paragraph -- what it is about. For each paragraph record its subject in a phrase of approximately 3 - 7 words. Place all answers on the answer sheet.

1.) Many plastics products require thin walls, stiffness and low cost. A blow molded gallon milk bottle requires a minimum of material and is easier to handle when made from a stiff resin like high density polyethylene. On the other hand, flexibility is of value in designing squeeze bottles for hair shampoo or plastic tubing which must be coiled. (Baird, 1976, 77)

2.) The paper stencil method of screen printing is the least expensive and the simplest to prepare. The stencil can be easily cut from paper and attached to the screen. Paper used for making stencils must be tough (but not too fibrous) to prevent tearing and rough edges. If water-base ink will be used for printing, the paper stencil should be made of waterproof paper. (Broekhuizen, 1979, 182)

3.) A party who fails, after a reasonable time has passed, to perform contractual obligations has breached the contract. The breach occurs whether the party has completely or partially failed to perform. In the case of complete failure, the contract is terminated. Partial failure to perform may require the injured party to pay for the work that has already been done. (Rosenberg & Bonnice 1976, 57)

4.) The Code requirements for the installation and construction of recessed fixtures are given in Section 410-64 through 410-72. Of particular importance are the Code restrictions on conductor temperature ratings, fixture clearances from combustible materials, and maximum lamp wattages. Recessed fixtures generate a great deal of heat within the enclosure. Thus, these fixtures are a fire hazard if they are not wired and installed properly. (Mullin, 1981, 70)

B. Paragraph Main Idea (4 points each)

Directions: This series of paragraphs will require you to write a statement of main idea -- including the most important information in the paragraph. Please write in your own words. Record your statements of main idea on the answer sheet.

1.) Many people in the United States get a large part of their calories from sugar, fats, oils, and alcohol. Since these foods are high in calories and have few, if any, nutrients, they are known as empty calories. When people eat too many empty calories, they may not get enough of the nutrients the body needs daily. Eventually, they may develop poor nutrition and health problems. (Kowtaluk, 1977, 63)

2.) After the work has been "roughed down," it must be finish turned to attain the proper size and surface finish required. Generally, only one finish cut is taken since the diameter should be only .030 to .050 oversize after the rough cut. The lathe speed is usually higher than that used for rough turning and a finer feed is used. A sharp toolbit with a slight radius on the point is desirable for finish turning. If the roughing toolbit was used to turn only a few pieces, the cutting edge may still be keen and therefore can be used for the finish cut. (Krar, 1971, 80)

3.) By program implementation, we mean the task of actually converting a problem solution, existing perhaps in the form of a flowchart, into a computer program. This task involves a number of clearly identifiable steps. The first of these is coding; in other words, actually writing the instructions. It's a rare programmer who can write error-free code; thus a second step in this process is program debug, which simply means removing the errors (or bugs) from the program. The final step is program testing. In this step, the program is used to process realistic, representative data, and the results are compared with expected results. These frequently being detected during testing and removed (debugged) by recoding portions of the program. (David, 1978, 218)

4.) The seven convenience receptacles are located around the perimeter of the living room. These receptacles are the split-circuit type. That is, the bottom portion of each receptacle is switch-controlled and the top portion of each is hot at all times. These receptacles are controlled by two three-way switches. One switch is located near the front hall and the other is located next to the door leading to the kitchen. (Mullin, 1981, 99)

5.) The uninformed body mechanic will usually seize a rubber mallet or hammer and start the job by striking at the center of the damaged area. While this will force a large area of the sheet metal back into approximately its original position, actually additional damage is being created. In fact this roughing out procedure has not corrected any of the basic damage. That is still there and in most cases some marks of the roughing hammer or mallet plus some stretched metal have been added to the original damage. Extra time, therefore, is required to restore the panel. (Toboldy, 1979, 23)

C. Paragraph Supporting Ideas (3 points each)

Directions: This section will measure your ability to recognize ideas which lend support to or further explain the main idea of a paragraph.

1.) Reread the 5 paragraphs given in the main idea section (item B) and determine at least three supporting ideas for each paragraph. Use your constructed main idea for each paragraph to help you decide on the supporting ideas; be sure that each supporting idea relates to that main idea.

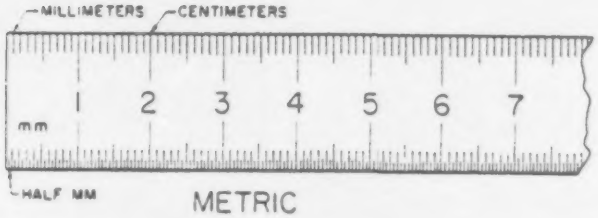
2.) List the supporting ideas in phrases (not a complete sentence) on the answer sheet.

D. Illustrations (3 points each)

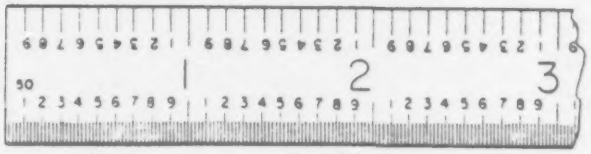
Directions: In this section you will be required to understand the meaning presented in three different types of illustrations. Write a brief explanation for the first two items; describe what you see and what the illustration is trying to show you, the reader. What is the significance of each illustration? For the third item, label as directed.

1.) Describe the meaning of this illustration. What is it telling you, the reader?

FRACTIONAL INCH



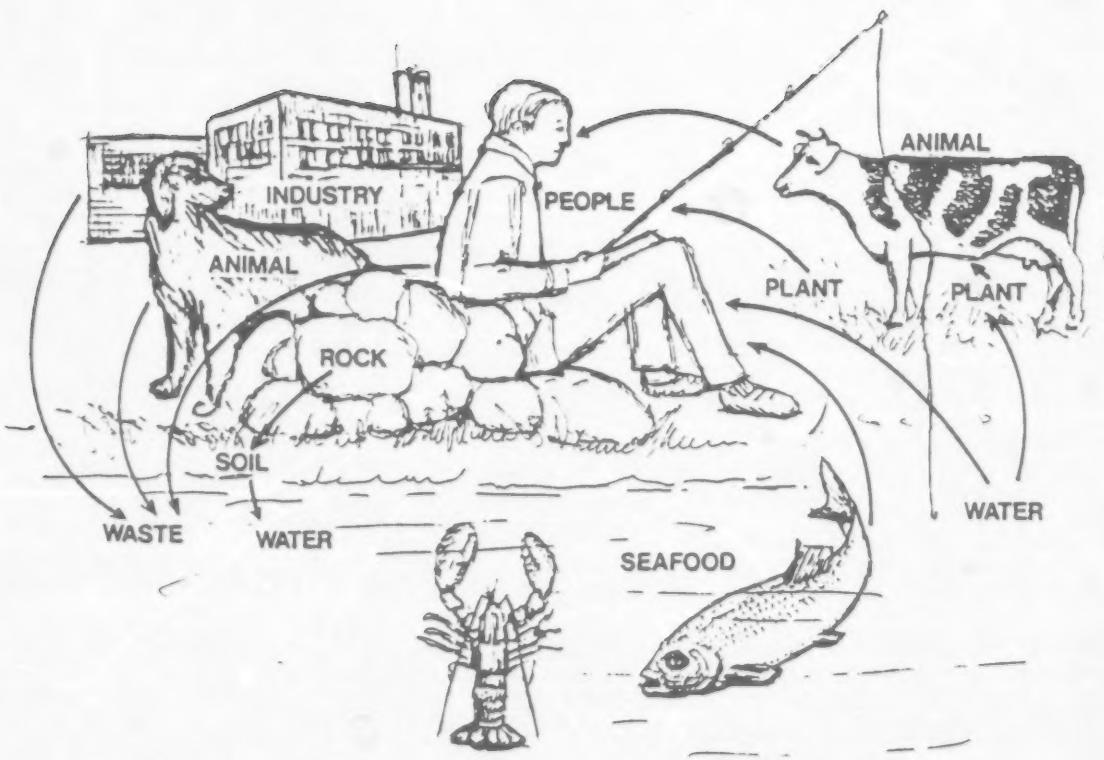
METRIC



DECIMAL INCH

(Walker, 1976, 39)

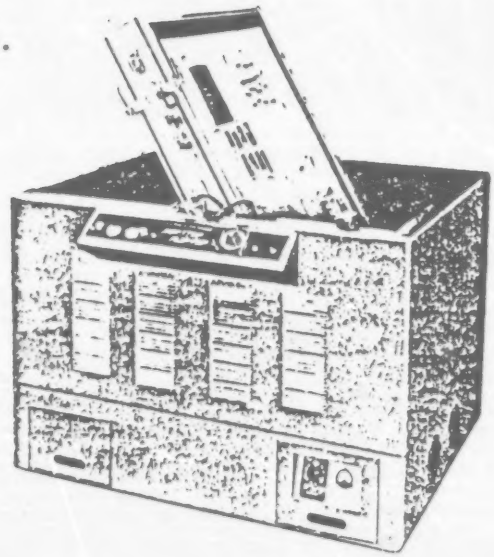
2.) Describe the process in this illustration. What is this cycle showing you?



(Kowtaluk, 1977, 32)

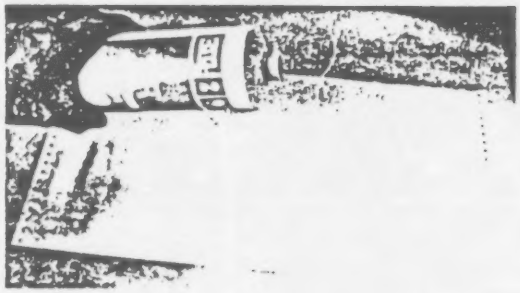
3.) The following illustration contains sequential pictures, which represent a process. Look at the pictures and then label accurately the text paragraph which is included on the answer sheet. Place the letter of each picture next to the appropriate sentence or sentences in the text paragraph which describes that picture.

A.

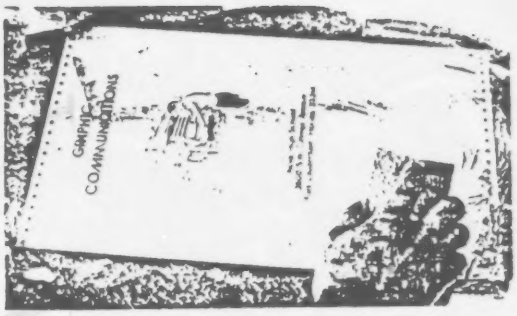


B.

C.



D.



E.

F.

(Broekhuizen, 1979, 252)

* Suggested point evaluations have been given for each section of this assessment. Points assigned to each answer will be determined by overall accuracy of answer. Other point systems may be assigned.

ASSESSMENT TWO -- COMPREHENSION

SAMPLE ANSWER SHEET

Name _____ Date _____

A. Paragraph Subject (Write a phrase)

1.)_____

2.)_____

3.)_____

4.)_____

B. Paragraph Main Idea (Write a sentence)

1.)_____

_____

_____

2.)_____

_____

_____

3.)_____

_____

_____

4.)_____

_____

_____

5.)_____

_____

_____

C. Paragraph Supporting Ideas (Write phrases)

1.)_____

_____

_____

_____

_____

2.)_____

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_____

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3.)_____

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4.)_____

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5.)_____

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_____

_____

D. Illustrations (Write a brief paragraph or label given paragraph.)

1.)

2.)

3.) After the flat has been prepared, a metal offset plate may be made. The platemaker is used for burning the plate. Open the vacuum frame and clean both sides of the glass to remove any dust or fingerprints. Place the metal plate in the vacuum frame with the presensitized side up.

Place the flat on top of the plate in the vacuum frame with the face up, or in a readable position. Align the gripper margin end of the masking sheet with one end of the plate. Close the vacuum frame, turn on the vacuum pump, and flip frame over so that the flat is now between the plate and the light source. Set the timer and expose the plate for desired length of time.

After exposure, the plate is rubbed up or developed to bring the image into view. Turn off the vacuum and remove the plate, placing it on a flat work surface. Pour a small puddle of process gum in the center of the plate and wipe it over the entire plate surface.

While the process gum is still wet, pour a puddle of developer on the plate. Use a sponge to spread developer over the entire plate surface. For best results, use very light pressure and long, even wiping strokes. The image will begin to appear as the plate is rubbed with the developer. Repeat the rub-up procedure for the second side of the plate. Apply running water to both sides of the plate to remove all traces of the developer. A cotton pad may be used to lightly wipe the plate surface during the rinsing operation.

Allow the plate to dry. Gum arabic is now used to coat the surface of the plate to prevent oxidation of the non-image areas. Gum arabic may be applied with a cotton pad to the entire plate surface.

COMPREHENSION ASSESSMENT

SUGGESTED - APPROXIMATE ANSWERS

A. Paragraph Subject (Answers should be concise -- not too general and not too specific.)

1.) Requirements for plastic products

2.) Paper stencil method of screen products

3.) Breach of contract: definition and consequences

4.) Code Requirements for installing recessed fixtures

B. Paragraph Main Idea (Answers will vary but these main points should be included.)

1.) Many Americans receive a large portion of their calories from "empty-calorie" foods and consequently may not get adequate daily nutrients.

2.) For proper size and surface finish, the roughed down work must be finish turned, generally with only one finish cut, done with a higher lathe speed and finer feed than used for rough turning.

3.) Program implementation, or the process of changing a problem solution into a computer program, includes the definite steps of coding, debugging, and testing which tend to overlap.

4.) The outer walls of the living room contain seven convenience receptacles of the split-circuit type, which are controlled by two three-way switches.

5.) The body mechanic who lacks knowledge about repair may strike the center of a damaged area on an automobile with a hammer and cause more damage and more time for repair.

C. Paragraph Supporting Ideas (Answers will vary but same ideas should be included.)

1.) A. foods high in calories, low in nutrition -- empty calories;
B. sugar, fats, oils, and alcohol -- empty calories foods;
C. people may develop poor nutrition and health problems.

2.) A. one finish cut, diameter should be only .030 to .050 oversize after the rough cut;
B. finish turning, sharp toolbit with a slight radius on the point is desirable for finish turning;
C. if roughing toolbit used to turn only a few pieces, cutting edge may be keen and useable for finish cut.

3.) A. problem solution existing perhaps in form of flowchart;
B. coding, actually writing the instruction;
C. program debug, removing the errors;
D. a rare programmer who can write error-free code;
E. program testing, program used for processing representative data;
F. testing, results are compared with expected results;
G. steps, overlap, errors found during testing, then removed by recording.

4.) A. split circuit, bottom portion switch-controlled and top portion hot always;
B. two 3-way switches, one near front hall and other next to door to kitchen.

5.) A. striking center, will force a large area of the sheet metal back into original position;
B. basic damage not corrected;
C. some marks of roughing hammer or mallet may be left;
D. stretched metal may have been added to original damage.

D. Illustrations (Answers will vary; main points should be included.)

1.) This illustration includes a comparison of three rules, each with a different type of measurement. The metric rule is compared to the fractional inch and the decimal inch rules.

2.) Chemical wastes from industry and other wastes from man and animal travel a continuous cycle from water and soil to plants, animals, and people and back into water and soil. Chemicals get into the food chain, either through soil and plants to animals or through the water to fish and animals.

3.) A - Open the vacuum frame . . . to . . . side up.
B - Place the flat on top . . . to . . . end of the plate.
C - Pour a small puddle of process gum . . . to . . . entire plate surface.
D - Use a sponge to spread developer . . . to . . . as the plate is rubbed with the developer.
E - A cotton pad may be used . . . to . . . during the rinising operation.
F - Gum arabic is used to coat . . . to . . . cotton pad to the entire plate surface.

ASSESSMENT THREE -- STUDY/READING SKILLS

To Teachers:

I. This assessment will determine more specific comprehension performance in "study situations." For this, you will use your own selected occupational materials which you will assign to your students for reading.

II. The following procedure is suggested for this informal assessment:

A.) Choose a two-page selection from your occupational text which is close to the beginning of a new chapter.

B.) Have students preview the selection (2-3 minutes). Do not explain guidelines to them; just assign the task.

C.) At the end of preview, ask students to write a preview recitation from memory -- any information they can remember from the preview (3-5 minutes). Encourage them to group ideas together for meaning, as well as recording individual names, words, numbers, etc.

D.) Then, ask students to study-read the selection 7-10 minutes). They can take notes if they choose to do so. Tell them they will be responsible for the understanding of the material.

E.) Have students (without selection and without using notes) answer ten multiple choice or short questions which you will need to devise with your own material (7-10 minutes). [In making the questions, vary difficulty and task, with some factual, others definition, main idea, and drawing conclusions.]

F.) For the last activity, assign students to write a summary of the material read -- without notes or selection (7-10 minutes).

III. Additional Guidelines:

A.) Assign a reasonable time limit for each activity. The preview time is the only one which should be strictly adhered to. Try not to "rush" students, so that they feel frustrated with this assessment.

B.) All writing for this is to be done from memory. Students may use own paper and should label selections carefully.

C.) This informal assessment can be given in a pre and post situation. The procedure should remain constant with the pre and the post measures, and the selections should be similar in difficulty of concept load and readability level. The first measure (pre) should be administered, followed by instruction of and student practice with study/reading skills (sections 8 & 9 in this manual), and concluded with second measure (post). The criteria for grading both the pre and the post should be parallel.

D.) The assessment can be administered one time only, either before instruction to see what needs to be emphasized, or after instruction of study/reading skills to evaluate student performance in that area.

E.) Points can also be assigned in this assessment. There are three written products to evaluate and a composite score of 25 points can be assigned (5-preview recitation, 10-comprehension questions, 10-summary). Using 25 total points eases the conversion to percentage scores for data recording.

F.) This assessment can be added to, to fit your needs. The tasks involved of reading and writing from memory, previewing, summarizing, etc. are important study/reading skills for the vocational student.

SECTION 4
INTRODUCTION TO THE GUIDE

READING THE VOCATIONAL TEXT/SKILLS PRESENTATION

Purpose:

This vocational text is designed to offer ideas and procedures for integrating reading skills with the occupational content of trade & industrial-related careers. To effectively read and understand the materials in this field, students need reading skill instruction and practice. There are two important concepts in teaching reading skills -- the introduction of technique and the opportunity for practice. As teachers, you can help provide this for your students by using the following suggested techniques and practice activities in your classroom.

Organization:

The following sections present important content reading skills and suggested instructional procedures. Only those skills particularly relevant to vocational texts have been included. And, each skill has been divided into segments requiring approximately 5-20 minutes of class time for introduction and for practice. Actually, this will not be additional work for you and your students since you will be using the content information to be learned; it will serve as a different method for learning it. Any suggested activities can be utilized as homework with the text assignments you would normally require at that point in your course. Since students must give careful attention to their text in order to complete the reading skill assignments, they will have the opportunity to "work with" the content material and to learn and understand it better.

Each section introduces a skill and uses a variety of vocational examples to clarify it. Given exercises provide opportunity for the application of the skill and the mastering of it. The explanations and exercises are given to you as vocational teachers, and can be adapted and used with your students. Some changes may be necessary to fit your particular needs.

Following the individual skill discussions is a section called "Suggested Reinforcement Activities/Textbook." Here, each skill can be applied to your course textbook and supplementary reading materials. With this, you will locate skill practice examples within the text; for use with your students. These same activities can in turn be assigned to your students for skill practice. This second application accomplishes three purposes: (1) It allows you to locate examples and sample exercises that you can use in your classroom, which will reduce preparation time; (2) It enables you to arrange skill instruction suitable to your text; and (3) It gives you an additional practice opportunity, and with the same materials your students will use.

At the end of each section are additional suggestions for teaching the new skills.

SECTION 5
DEVELOPING VOCABULARY SKILLS

DEVELOPING VOCABULARY SKILLS

To better understand the field of trade & industrial careers the student must know the specialized technical vocabulary. Without understanding of "trade & industrial-related" words, the student cannot gain enough information from the reading material. Since complete knowledge of vocabulary and rapid comprehension of this content are critically important, most textbook authors have purposely provided definitions and other aids (varied type, contextual clues, etc.). Five of these aids are discussed on the following pages: formal definition, synonyms, inferential clues, illustrations, and glossaries.

Contextual Analysis

A practical way to build technical vocabulary is through contextual analysis -- learning the meaning of a word through its use in a sentence. Usually the author will define a technical term the first time it is used. From then on the student must remember it and recognize it as it is used in context. "Clues" within the sentences become important in learning and in remembering the necessary occupational vocabulary; they are the bits of information which help you arrive at the meaning. The following discussion of contextual analysis includes formal definition, synonyms and inferential clues.

A. Formal Definitions

Often an author will define an important technical term in the sentence that introduces it.

Example: Coated abrasives is a general term for all abrasives used in refinishing automobiles (Toboldt, 1979, 30).

Term	Definition
coated abrasives	all abrasives used in refinishing automobiles

Clue words tell the reader that a definition is included in the sentence. The clue words in this example are "is" and "general term." Other clue words which the author might use are: means, are, is referred to, is called, is one that, and is defined as. Also, dashes (--) may be used to set off formal definitions.

Exercise A: Practice this vocabulary skill by locating the technical term and its definition in each of the following items. Remember that a technical term is a word specific to the occupation and it may include one word or several.

1. Justification is the process of spacing outlines of type so that each line is of equal length and equally tight in the composing stick (Broekhuizen, 1979, 72).

Term	Definition
_____	_____
	_____

2. Indexing can be defined as the act of matching the circumference of a workpiece into any desired number of divisions (Lascoe, Nelson, Porter, 1973, 299).

Term	Definition
_____	_____
	_____

3. Place of first use means that if a scoop is needed, it is located where a worker may reach it easily as he begins his task (Corneluis, 1979, 66).

Term	Definition
_____	_____
	_____

4. Parts in service are subjected to three main types of wear: impact, abrasion, and corrosion. Impact referes to crushing forces which cause parts to chip or crack. Abrasion is associated with grinding, rubbing or gouging actions. Corrosion involves the destruction of a surface because of atmospheric contamination (rusting), chemicals, and oxidation or scaling at elevated temperatures (Giachino, Weeks, 1976, 313).

	Term	Definition
1.	_____	_____
		_____
2.	_____	_____
		_____
3.	_____	_____
		_____
4.	_____	_____
		_____

B. Synonyms

As an alternative to a formal definition, trade & industrial-related occupational literature may clarify a technical term in the context by the use of a synonym. A synonym is a word or words which are similar in meaning to another word. The synonym may be enclosed in commas or parentheses directly following the term, may be separated from the term by the word "or," or may be set off by dashes (--).

Example: All oils foam to some extent from the vigorous agitation and aeration (air-mixing) in an automobile engine (Glenn, 1976, 86).

Term	Synonym
aeration	air-mixing

Exercise B: Locate the term and the synonym in each of the given paragraphs.

1. One must understand the system to accurately diagnose (identify) mechanical difficulties (Althouse, Turnquist, Bracciano, 1975, 99).

Term	Synonym
_____	_____

2. One of the earliest methods of graphic communication was that of making pictures, or symbols, that would convey ideas to the observer. Most prominent among these systems were the hieroglyphics (literally sacred-writing) of the Egyptians, and the picture-writing of the early American Indians (Polk, Polk, 1971, 3-4)

	Term	Synonym
1.	_____	_____
2.	_____	_____

3. Manufacturers have adopted a standard EIA (Electronic Industries Association) color-coding system for determining resistance or ohmic values of low-powered resistors (Zbar, 1966, 1).

Term	Synonym
_____	_____

C. Inferential Clues

Sometimes an author makes the meaning of a word clear, but doesn't actually define it. Also, as mentioned before, a technical term may be defined once early in the book, and then used later without definition. In both cases, the reader must use all the clues in the surrounding sentences (the context) to determine meaning; he must infer the meaning. Students reading the following excerpt should be able to determine that vapor is something that can flow but is not a liquid; this is not directly stated, but the context helps the reader to draw that conclusion.

Example: Any liquid refrigerant that flows into the accumulator will be evaporated. Then vapor will flow into the suction line (Althouse, Turnquist, Bracciano, 1975, 103)

Exercise C: Read the following three selections and then briefly list the clues which would help the reader analyze the meaning or partial meaning of the term given.

1. Salads should be zesty and piquant -- never bland. The flavor may be in the ingredients or in the salad dressing. Mild-flavored salad ingredients need a piquant dressing. For instance, a sharp, blue cheese dressing is well-liked on a lettuce salad. However, chicken, which has a strong flavor of its own, needs a mild mayonnaise-type dressing (Ray, Lewis, 1980, 167-168).

a. Term: Piquant

b. Clues which could help reader arrive at meaning:

c. Inferred definition:

2. The jaws of an adjustable wrench are turned at an offset from the handle to facilitate working in tight places. With this offset, the wrench can be rotated one-quarter turn, and then reversed to make another quarter turn in the same small opening (Zinngrabe, Schumacher, 1974, 43).

a. Term: Offset

b. Clues which help reader arrive at meaning:

c. Inferred definition:

3. After use, the type is cleaned of ink. It is then distributed back into the proper compartments of the type case for use when next needed. Because hand composition of type is an expensive operation, it is now largely replaced by machine methods, except sometimes for those cases where only a few lines of display are involved (Cogoli, 1980, 47).

a. Term: Hand composition

b. Clues which help reader arrive at meaning:

c. Inferred definition:

Illustrations

A common type of definition in an occupational text is the illustration, or graphic material. Unfortunately, students often skip the illustrations when they are reading-assuming the printed words are more important. An initial task for the instructor is to emphasize to the students the need for immediate study of the designated figure whenever it is mentioned in the content of the text (Example: See Figure 8-2). The illustration will help them to visually understand the technical term to be learned. With repeated practice students can later apply the visual definition automatically to the term in content.

Example: Notice the way in which this illustration defines the term that is explained in the text.

> An assembly print shows the complete and assembled object. This type of print is intended to show the relationsnip of one part to another when assembled into a unit, and to give an indication of the general appearance of the assembly. Broken lines are usually omitted to simplify reading of the print. The welder uses this type of print as a guide for assembling finished parts.

Figure 10: Illustration

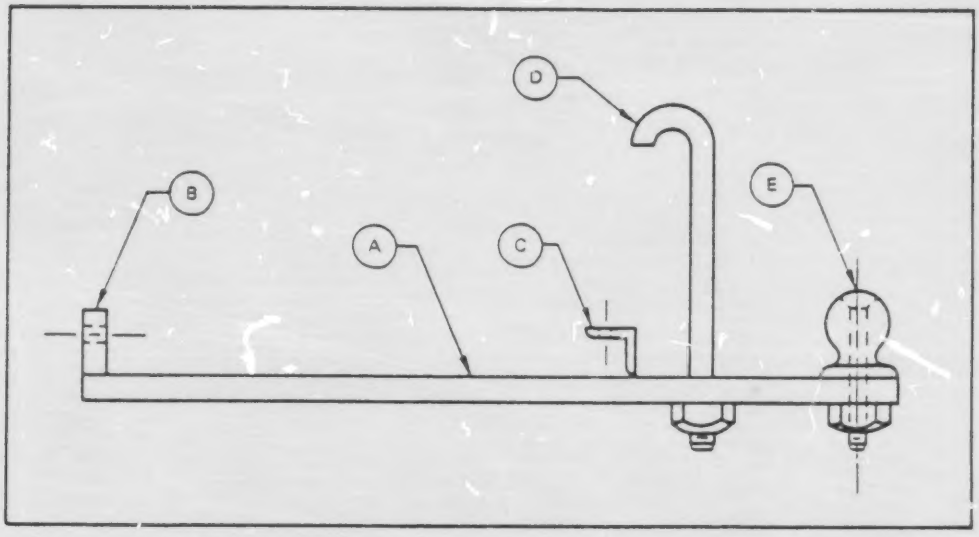


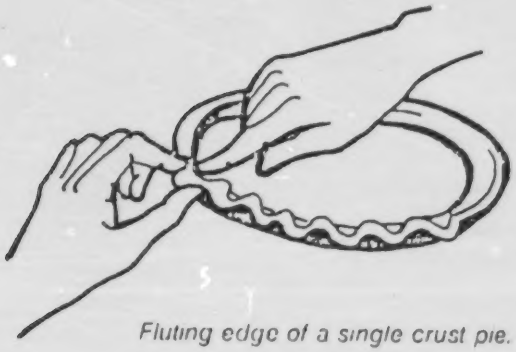
Fig. 8-2 Assembly print

Pg.#	Pg.# Ill.	Term
81	81	Assembly Print

Exercise D: Using each of the following illustrations and accompanying content material, list the occupational terms that are explained.

1. For a single-crust pie, fold under the pie dough even with the edge of the pan. Flute by pressing the edge with the index finger of the right hand between the thumb and index finger of left hand, making an attractive edging. Chill before baking to reduce shrinkage (Ray, Lewis, 1980, 311).

Figure 11: Illustration



Fluting edge of a single crust pie.

Pg.# term	Pg.# Ill.	Term

2. A bench plate or stake holder is used to hold the stakes while they are being used. The bench plate is a cast iron plate fastened to a bench. Tapered holes of different sizes in the plate support the stakes. The smaller holes are used for bench shears.

   The revolving stake holder can be mounted in any position desired by means of the clamp. Metal cabinet stands are also available for bench plates and individual stake mounting (Zinngrabe, Schumacher, 1974, 108).

Figure 12: Illustration

Figure 18-1 Bench plates.

Pg.# term	Pg.# Ill.	Term

3. The basic parts of a process camera are the lens, front case, bellows, camera back (rear case), copyboard, and lights. There are many more additional parts and features on any specific camera. The student should locate and become familiar with the comparable units on any camera used (Cogoli, 1980, 127).

Figure 13: Illustration

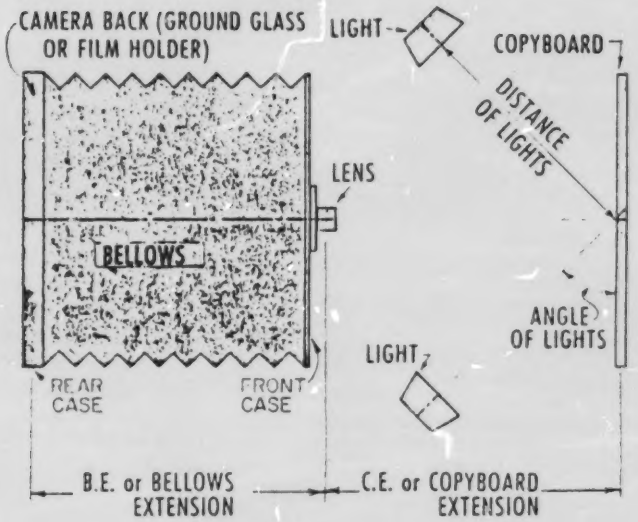


Fig. 8-12. Basic parts of the camera.

Pg.# term	Pg.# Ill.	Term

Glossaries

Many current vocational texts include glossaries (listings of important vocabulary) at the end of the chapter or at the conclusion of the book. The teacher's task is to stress the need for the student to use this vocabulary aid. During much of the course students should be required to review the glossary before beginning a new chapter. Students would either review the one at the end of the new chapter or those words indicated by the teacher in the glossary in the back of the book. As students read the chapter and encounter a new word that is defined in the glossary, they can note it on notepaper, along with the definition. This can be included with the notes on that particular chapter -- either within the class notes or on a separate piece of paper.

Exercise E: Suggested Reinforcement Activities/Textbook

Select an introductory chapter from the vocational text you use in your teaching. Look for the vocabulary aids just introduced and discussed.

This will help you to better understand the skill and its major parts and will show you examples to use when teaching this skill. These same activities can be assigned to your students for practice and reinforcement of the vocabulary skills.

I. Contextual Anaylsis

A. Formal Definitions

	Pg.#	Term	Clue Word	Definition
1.				
2.				
3.				
4.				
5.				

B. Synonyms

	Pg.#	Term	Synonym
1.			
2.			
3.			
4.			
5.			

C. Inferential Clues

	Pg.#	Term	Definition	Clues (Words, Phrases)
1.				
2.				
3.				
4.				
5.				

II. Illustrations

	Pg.# Ill.	Terms defined by illustration
1.		
2.		
3.		
4.		
5.		

III. Glossary

	Pg.#	Terms found in glossary for this chapter
1.		
2.		
3.		
4.		
5.		

Procedures: Teaching Students Improved Vocabulary Skills

Vocabulary skills should be introduced and practiced throughout the course. Instruction of new techniques and discussion of examples will require approximately 15-20 minutes. Giving students the chance to recontact the word is very important since this is what helps the new occupational term to remain in a student's vocabulary. A new word is easily forgotten if it is not "seen again." These terms should be recontacted over a period of time. Suggested activities for recontact are:

1) Teacher reviewing students orally in class.

2) Students reviewing each other orally.

3) Teacher assigning students to write a paragraph using five of the technical terms recently or previously learned.

4) Students making flash cards for quick review, with word on the front and definition on the back.

5) Teacher using a CLOZE paragraph where students must fill in appropriate occupational terms.

Additionally, students should be encouraged to keep a collective list of content vocabulary with definitions and page location in text per chapter. With this, students can recognize words to be learned and see the relationship words have to each other in that particular chapter. They will have a definite guideline for words to be learned. This activity can be classwork, be assigned as homework, and be evaluated for credit.

In selecting paragraphs and specific examples to teach the vocabulary skills, begin simple and increase to the longer and the more difficult. Students first need to gain confidence in the particular vocabulary skill. This can be done with both the textbook materials and the manufacturers' materials.

The instruction of vocabulary skills should be spread throughout the course. Introduce each vocabulary technique and give opportunity for practice. Emphasize the "occupational" terms since the learning of them is vitally important to the understanding of the written material, text or manufacturers'.

SECTION 6
DEVELOPING COMPREHENSION SKILLS: THE PARAGRAPH

DEVELOPING COMPREHENSION SKILLS/THE PARAGRAPH

Understanding paragraph organization is an important reading skill for the vocational student. A paragraph has three major components:

1) the subject (what is being talked about)

2) the main idea (the most important information about the subject)

3) the supportive information (details that make the information clearer)

Of these, the main idea is the most crucial, for the key points of a chapter or article are simply selected main ideas from component paragraphs.

Look at the following paragraph. Search for the subject, the main idea and the supporting details.

> People in the United States have increased the amount of fat they eat every year. There has been a marked change, however, in the type of fat eaten. Consumers today use fewer animal fats and more vegetable fats and oils. For instance, margarine and non-dairy coffee whiteners and whipped toppings are more popular then dairy products such as butter and cream. Vegetable shortenings have replaced lard for cooking and baking. (Kowtaluk, Kopan, 1977, 81)

The subject here is "consumption of fat," because parts of the paragraph refer to that topic. The main idea, or collection of the most important information is: "The American people are eating more fat, but vegetable fats are now consumed more than animal fats." The rest of the paragraph provides supportive information, such as: "marked change in type of fat eaten . . ." and "Vegetable shortenings have replaced lard . . ." and "margarine

and non-dairy coffee whiteners are more popular than . . ."

Paragraph Subject

The key to finding the subject of the paragraph is locating the one topic that everything else in the paragraph is related to. A paragraph usually discusses one small aspect of a larger topic; therefore, the paragraph subject must not be too general. It must identify the specific topic being discussed. At the same time, the subject cannot be too specific, as it must cover the range of the ideas presented in the paragraph.

Example: Read the following paragraph and look for its subject.

> The source from which the machinist gets his information before scribing lines on the metal is generally a black-and-white print or a blueprint. The layout dimensions for the workpiece are taken from the blueprint and from specifications covering the job. The dimensions given on the blueprint represent the actual size of the finished workpiece. (Lascoe, Nelson, Porter, 1973, 75)

In this example students might select "aids for the machinist" as the subject; this is much too general. Conversely, a chosen subject of "what the dimensions on a blueprint represent" would be too specific. The correct choice of subject is "definition of a blueprint."

Exercise A:

Determine the subject of the following paragraphs. Be certain that all paragraph information relates to that subject.

1) The gluten in flour makes the dough sticky. As the mixing of the dough proceeds, the gluten in the flour becomes elastic and pliable. The more the dough is mixed, the more elastic the gluten becomes. When the

dough is baked, the gluten coagulates, or becomes firm. It forms, along with the starch, the structure of the product. (Ray, Dondi, 1981, 307)

Subject: _____

2) Copy is held in place by the copyboard, which is attached to the same rail or track as the front case. Most copyboards consist of a frame with a spring-loaded back or foam cushion. The pad is covered with a glass lid that covers the copy and locks into place. The center of the copyboard is in line with the center of the camera back. It moves either forward or backward on the rail or track to make adjustments. (Dennis, Jenkins, 1974, 146)

Subject: _____

3) The rotary engine has several advantages as compared to the reciprocating piston engines now in popular use. It is considerably smaller and lighter. It is an extremely simple engine, using many less parts. It has no reciprocating (back and forth) motion, produces less vibration and offers significantly more horsepower than a reciprocating engine of comparable size. (Stockel, 1978, 159)

Subject: _____

Paragraph Main Idea

The main idea of a paragraph includes the most important information of that paragraph. The following four guidelines can help in its location:

1. If the paragraph includes the definition of a term, that term might be part of the subject. The definition might be part of the main idea.

2. If there are examples, these may illustrate all or part or the main idea.

3. If a key word or phrase is repeated, it might be part of the subject or main idea.

4. Highlighted words might be part of the subject or main idea.

Note that the word "might" is used in each instance. These guidelines can point toward possible main ideas, but they cannot automatically select the right one.

The main idea is not necessarily the topic sentence. It is a statement which includes all the most important ideas of the paragraph, and they may be contained throughout the paragraph. Looking effectively for this "framework" requires much practice. Therefore, writing a statement on main idea is helpful, and recommended for teaching skill of main idea. The following procedure should be used when making a statement of main idea:

1. Look for the most important ideas in the paragraph.
2. Write them in a statement in your own words.
3. Be brief and concise.

Example: Some developing countries have nutrition education programs to help people make better use of their food supplies. In India, mobile kitchens are staffed by home economists who teach improved methods of cooking and preserving food. Turkey has a school garden program. In countries such as Volta, Botswana, Malawi, Chile, and Peru, people are taught the nutritional value of locally produced foods and how to grow them. (Kowtaluk, Kopan, 1977, 167)

A statement of main idea could be:

Developing countries around the world are educating their people in nutrition and in growing, cooking, and preserving food to encourage better use of food.

Exercise B:

Look at the following four text selections. First ask yourself what the paragraph is about (the subject). Then look for the main idea using the suggested guidelines. Note which guidelines are most helpful in each case. Finally, make a statement of main idea with aid of the suggested procedure. (It may be helpful to underline words and pharses which pertain to the important information.)

1) Chip problems must be solved before a satisfactory hole is produced. The chips should be broken into small particles, the smaller the better. Small chips are easily removed either by the conveyor action of the helical flutes, gravity, coolant pressure, or withdrawal of the drill. Smooth polished flutes are very desirable especially for materials of high ductility (like lead). (Lascoe, Nelson, Porter, 1973, 127)

   A. Subject: _____

   B. Statement of Main Idea: _____

   _____

   _____

2) Ground beef to be grilled is often extended with ground soybeans, cereal flours, and bread crumbs. These extenders may be purchased in dry or frozen form. They may be flavored or unflavored, colored or uncolored. Recently, they have become available for home as well as food service use. Perhaps you have noticed them on the supermarket shelves. The quality of the extenders is governed by regulations from the USDA. Because of the high price of meat, extenders are in general use. (Ray, Dondi, 1981, 190)

   A. Subject: _____

   B. Statement of Main Idea: _____

   _____

   _____

3) An oil bath air cleaner pulls the air down a passageway, forces it to make a sharp bend over a puddle of oil, back up through a mesh, and over and down into the carburetor. The air gains considerable speed as it travels down into the cleaner. When it makes the sharp bend, just above the oil, the heavier dust particles cannot make the corner and are slammed into the oil where they settle to the bottom. The wool-like mesh stays wet with oil and cleans the air even more. (Stockel, 1978, 150)

A. Subject: _____

B. Statement of Main Idea: _____

_____

_____

4) Note: With this vocational text extraction, record the subject and main idea for each paragraph. Use the chart provided.

Almost as important as preparing copy is protecting it until it is photographed. Much time, effort, and expense are wasted when copy is damaged, soiled, or destroyed before it can be used.

All copy should have a protective overlay sheet attached to one edge. It can be either tissue (tracing) paper or bond paper, and is usually attached with either tape or rubber cement. The overlay sheet is also often used as a place to make notes to the photographer or the printer.

Copy should be transported and stored so that it will not curl, fold, or tear. A convenient storage and mailing technique is to place the copy in a large envelope. The envelope should be clearly marked with notations to describe the piece of copy, the person for whom the copy was prepared and the name of the person who prepared the copy.

Special attention should be given to handling photographs. It is best to mount them on heavy mounting board when possible. Never make marks on either side of a photograph, except in the borders. If notes must accompany a photograph, place them on a separate sheet of paper. Attach this sheet of notes to the photograph.

Always handle copy so that dirt or smudges will not

get onto it. Handling copy by the edges will prevent fingerprints from getting on the image areas. Try to keep your hands very clean when working with copy, and never have food or drinks around the places where copy is being prepared or used. Many companies have extremely strict rules of cleanliness which must be observed when preparing and working with copy. (Dennis, Jenkins, 1974, 125)

Subject	Statement of Main Idea

Paragraph Supportive Information

Authors use supporting ideas to carry out their main ideas. They may present these supporting ideas in several ways: giving particular cases, using a restatement, giving reasons, and making comparisons and contrasts (Blake, 1973, 23). Supportive information helps us to understand the meaning of the main idea, since it provides explanation. Each supporting idea must refer to that main idea.

Author's clues help us to locate supporting ideas. Examples of these clues are: "for example," "for instance," "that is," "in other words," "for these reasons," "consequently."

Example: Review this paragraph again, and look now for the supporting ideas.

> Some developing countries have nutrition education programs to help people make better use of their food supplies. In India, mobile kitchens are staffed by home economists who teach improved methods of cooking and preserving food. Turkey has a school garden program. In countries such as Volta, Botswana, Malawi, Chile, and Peru, people are taught the nutritional value of locally produced foods and how to grow them. (Kowtaluk, Kopan, 1977, 167)

A. Restatement of Main Idea

<u>Developing countries around the world are educating their people in nutrition and in growing, cooking, and preserving food to encourage better use of food</u>.

B. Supporting Ideas:

1) In India, mobile kitchens are staffed by home economists . . .

2) Turkey has a school garden program.

3) In countries, such as Volta, Botswana, Malawi, Chile, and Peru, people are taught . . .

In this paragraph, the typical clue words are not given. However, the supporting ideas are emphasized through the names of individual countries and what is specifically happening there.

**Notice that the supporting ideas lend explanation and example to the information in the main idea.

Exercise C:

Turn back to the paragraphs in Exercise B in which you were to make statements of main idea. Use the main idea of each to help you locate supporting ideas. Remember that each supporting idea must relate to that main idea. (This can help you to determine the accuracy of your main idea.)

For each of the first 3 paragraphs, record the main idea and the supporting ideas. For item #4 with the multi-paragraph extraction, select one of the paragraphs and do the same.

1) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

2) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

3) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

4) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

Paragraph Comprehension and Illustrations

Paragraph comprehension can be reinforced by the proper use of illustrative material. In trade & industrial-related literature processes are often illustrated by sequential diagrams. Students must learn to "read" the diagram in its proper sequence and to relate each phase to the appropriate portion of the prose (text material). With some trade & industrial occupations, processes

are shown in single diagrams by the use of arrows and numbers.

At other times non-sequential illustrations are used to highlight the important concepts (usually the main idea) presented in the prose that do not describe a process.

A. Sequential Illustration -- Process

Figures 14 and 15 utilize step-by-step illustrations to clarify the text material. Selections such as these can be duplicated for student practice; students can integrate the text and the illustration by drawing lines from the words in the material to the corresponding phase of the diagram, or by cross-referencing (parallel labeling of the prose and illustration).

Figure 14: Illustration

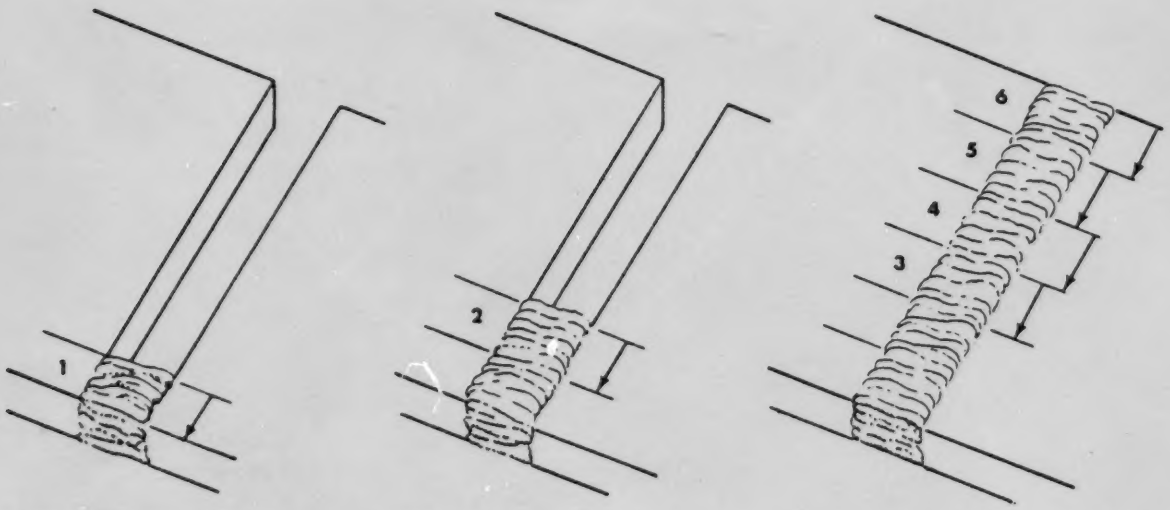


Fig. 3-27. This is how the back-step welding technique is done.

The use of the back-step, or step-back, welding method also minimizes distortion. With this technique, instead of laying a continuous bead from left to right, you deposit short sections of the beads from right to left, along the entire seam. (Giachino, Weeks, 1976, 36)

Figure 15: Illustration

1. Complete the necessary design and layout, composition, photography, plates, and printing steps. Letterpress, offset-lithography, or screenprinting image-transfer methods can be used to produce printed sheets. It is important to do a good job of printing the image on the receptor sheet.

2. Apply the special thermography powder to the sheets while the ink is still wet. Immerse the entire image area of the sheet in the pan of powder.

3. Remove the excess powder by tapping the sheet sharply over the pan containing the powder.

4. Heat the sheet to melt the powder and fuse it with ink by:
   a. Putting the sheets through a hand-fed thermography machine, or
   b. Holding the sheets over the heat of a standard hot plate until the powder melts and fuses to the ink.

5. Allow the sheets to cool before stacking and packaging.
(Dennis & Jenkins, 1974, 342)

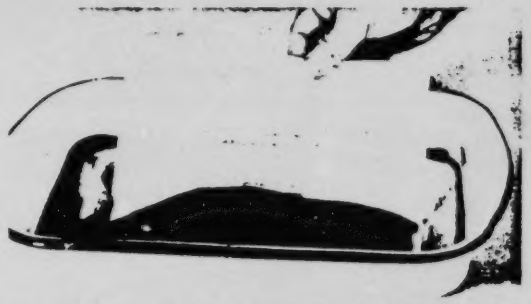


Fig. 119-4. Immersing freshly printed sheets in the thermography powder.

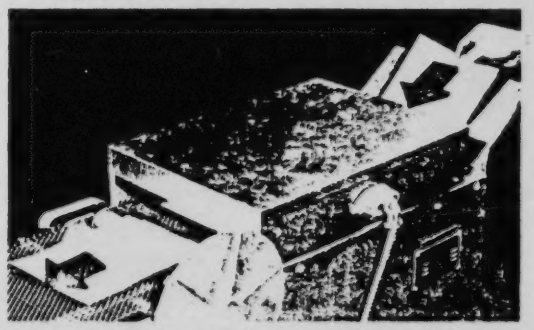


Fig. 119-5. Placing freshly printed sheets through a hand-fed thermography machine.

Fig. 119-6. Holding the freshly powdered sheet over a hot-plate to melt the thermography powder.

B. Single Diagram -- Process

In some of the trade & industrial-related occupations, a single diagram is given to illustrate a process. Numbers, arrows and labels are used to show the process. This type of illustration is common with vocations, such as auto mechanics, machining, and welding.

Note the following diagrams of this type from an auto mechanics occupational text (Stockel, 1978, 77).

Figure 16: Illustration

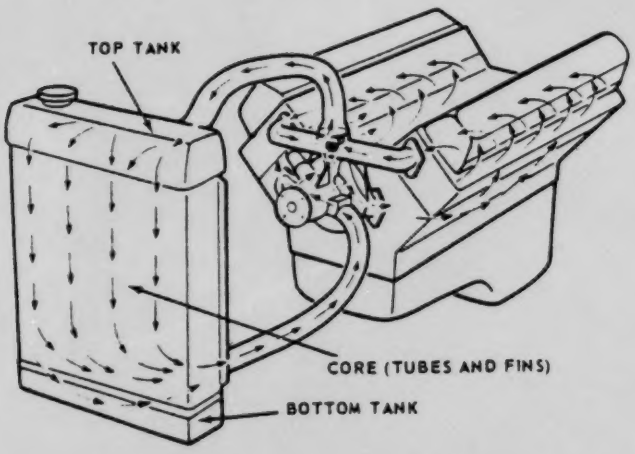


Fig. 4-15. Coolant flow path in a system using a down-flow radiator.

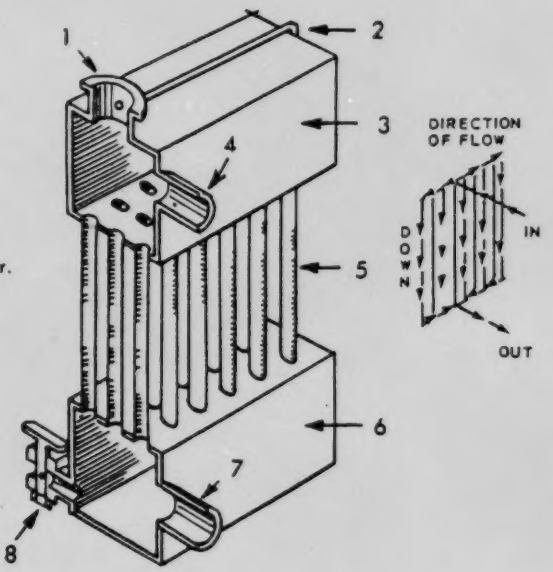
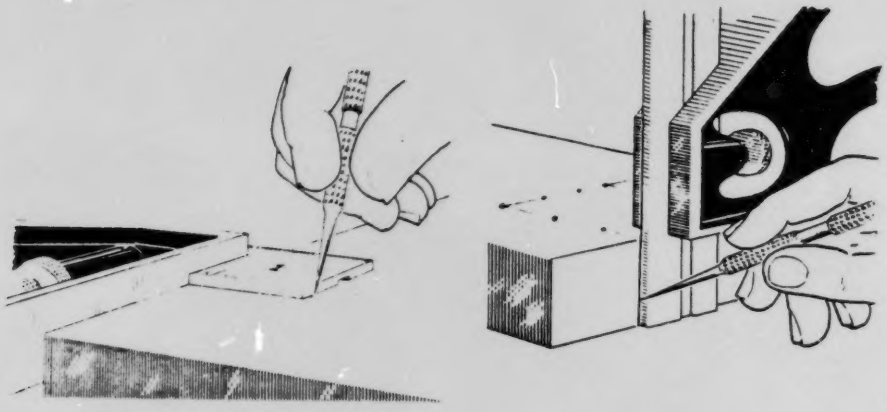


Fig. 4-16. Typical radiator. Water enters the top hose connection 4, then passes into top tank 3. From there it flows down through core tubes 5. When it reaches bottom tank 6, it has cooled. 1—Filler neck. 2—Overflow tube. 7—Lower hose connections. 8—Drain petcock. Not shown are thin fins soldered to core tubes.

C. Non-sequential Illustrations

Figure 17 uses illustrations that are not sequential to clarify text material. In this case, a process is not described. Again, students should relate each part of the illustration with the appropriate phrases in the paragraph by drawing connecting lines, or by cross-referencing.

Figure 17: Illustration



A line can be scribed on the metal surface by drawing the scriber along the edge of the rule at a slight angle, as you would a pencil. The point of the scriber must be kept tight against the guiding edge of the rule. The combination square is used in scribing parallel lines and for scribing lines at right angles.
(Lascoe, Nelson, Porter, 1973, 78)

Exercise D: Suggested Reinforcement Activities/Textbook

1) Select 4 paragraphs of average length, each from a different chapter of your textbook. Identify the subject in each.

	Page #	Column #	Paragraph #	Subject of Paragraph
1.				
2.				
3.				
4.				

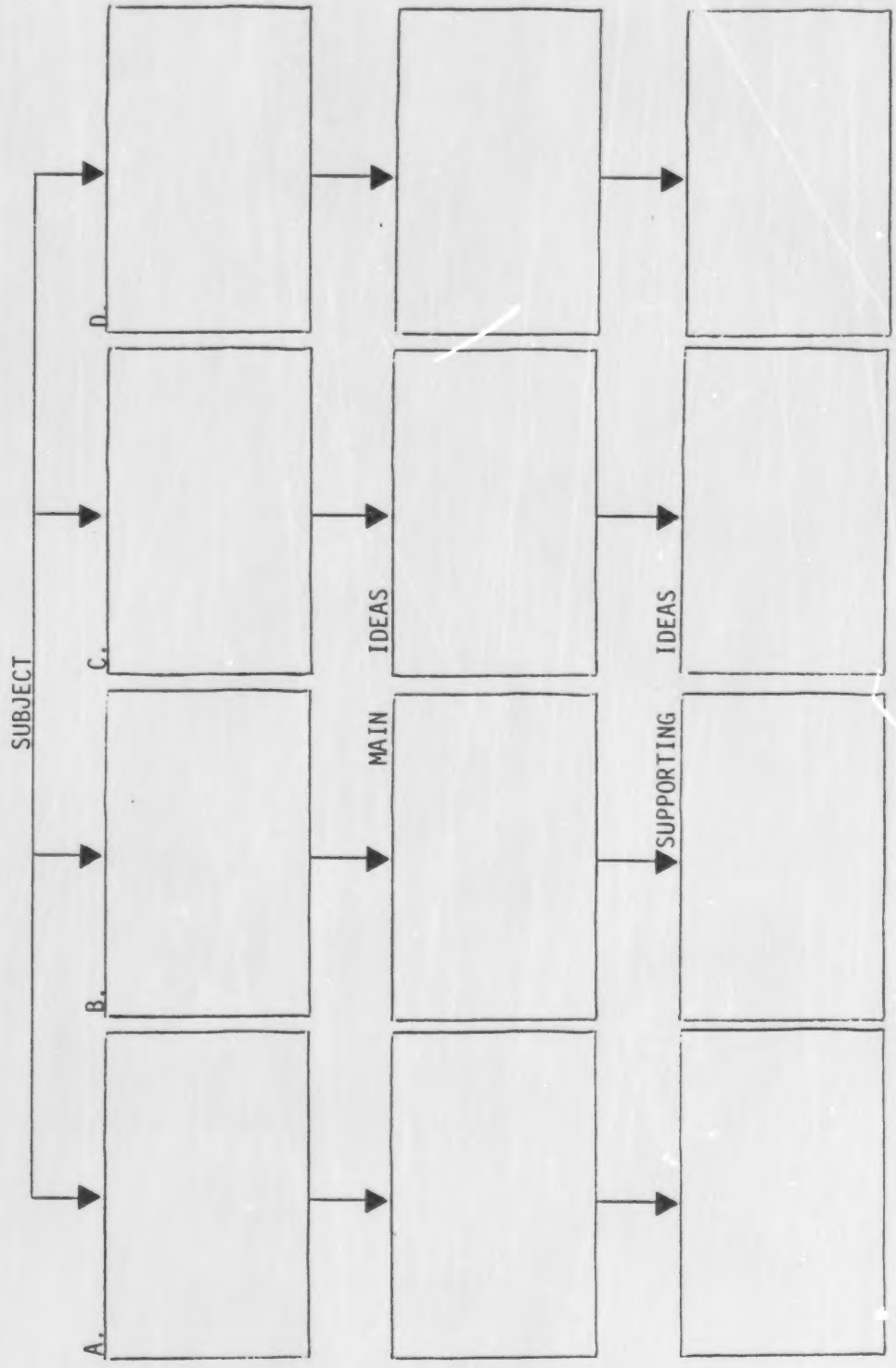
2) Select four paragraphs from your textbook, each from a different chapter. Identify the subject, and write a statement of main idea for each.

	Page #	Column #	Paragraph #	Subject	Statement of Main Idea
1.					
2.					
3.					
4.					

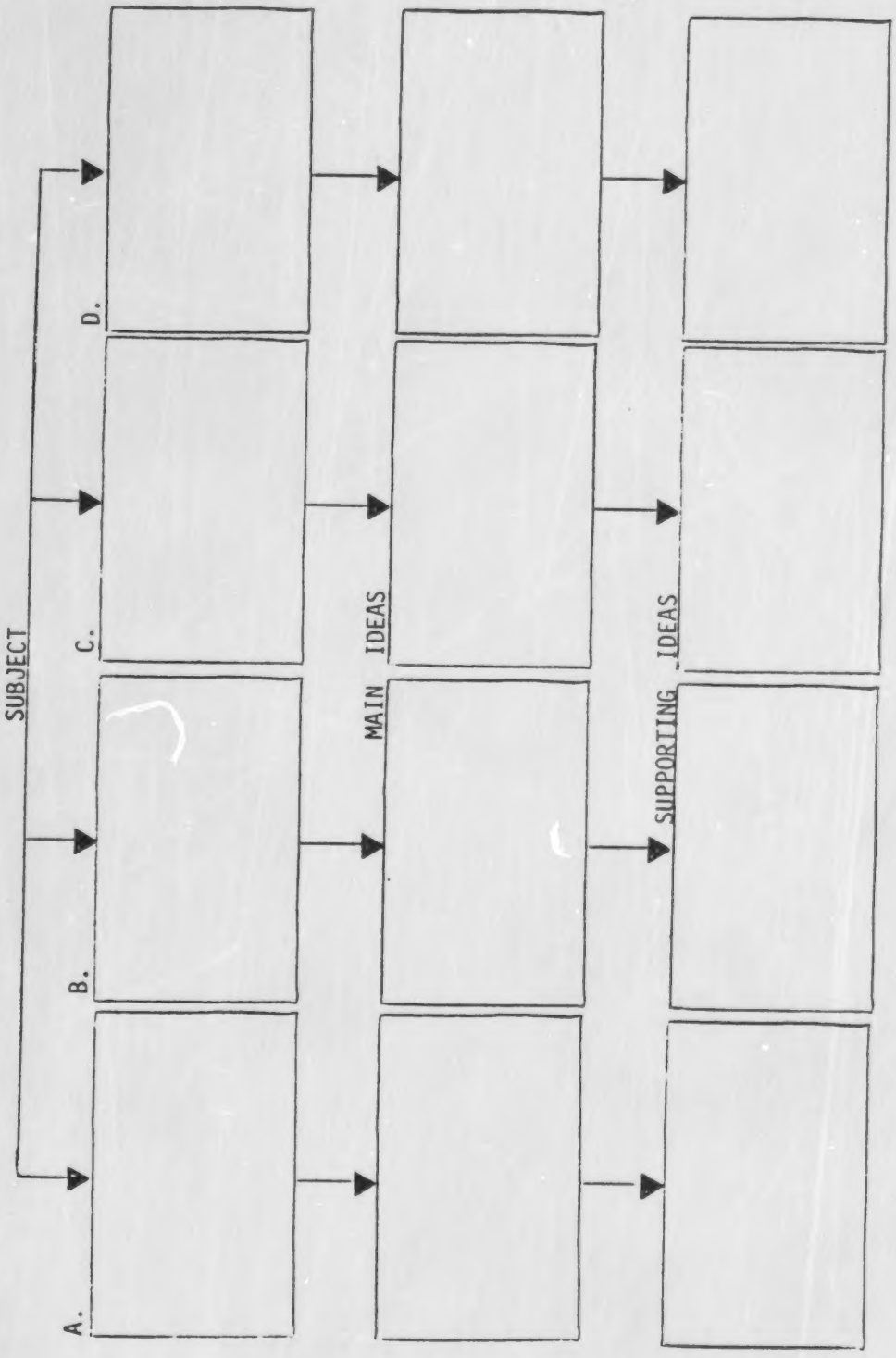
3) Next, choose four sequential paragraphs of a text chapter, Identify the subject and write a statement of main idea for each.

	Page #	Column #	Paragraph #	Subject	Statement of Main Idea
1.					
2.					
3.					
4.					
5.					

4) Take the same paragraphs selected for item #2 and find supporting ideas. Complete the following chart



5) Use the same paragraphs selected for item #3 and find supporting ideas. Complete the following chart.



6) Select four sequential and/or non-sequential diagrams that illustrate the main idea of a paragraph within the text material.

	Illustration Page #	Prose Page #	Subject
1.			
2.			
3.			
4.			

Procedures: Teaching Students to Better Understand the Paragraph

Understanding the paragraph is one of the most important and one of the most difficult reading skills the vocational instructor must teach. It is the basis of understanding what is read; it is definitely needed knowledge for the higher-level comprehension skills, which are necessary for trade & industrial-related literature.

Recognizing the framework of the paragraph (the subject, the main idea, the supporting ideas) requires the ability to distinguish. Students need careful guidance in identifying the subject, and distinguishing among main idea information, supporting idea, and material that is totally unimportant. It is necessary to introduce the material slowly and incrimentally, as was done here. Students need to be aware of the importance of their understanding the paragraph, so that they can exert maximum effort to this reading skill.

In your instruction, move slowly through the information. Three or more class sessions should be given to the introduction of each of the paragraph components, with assigned practice for outside of class. When the students show competence with the first component (the subject), move to main idea and introduce this gradually, presenting and practicing each of the four clues. With main idea, emphasize the concept of "what is the most important information the author is giving you in this paragraph." Discuss how to make a statement of main idea by using the suggested guidelines. The practice of writing the main idea will help to clarify

this skill and to make it a usual reading behavior.

Then progress to the supporting ideas, discussing the different types and emphasizing the function of this component. Students should clearly understand that supporting ideas must relate to the main idea, and that they help to explain.

Practice with integrating text material and illustrations will be equally useful to your students. Trade & industrial-related literature contains various illustrations and diagrams which help to explain the main points expressed in the prose. The visual reinforcement can be most beneficial.

Important Considerations:

A. Introduce paragraph components gradually over a period of time.

B. These skills need to be practiced frequently so the students can acquire competence with them.

C. In using text extractions for examples and assigned practice, begin short and build to longer selections. Also, begin easy and increase to more difficult material.

D. The paragraphs you identified in "Suggested Reinforcement Activities" can be assigned for location of subject, main idea, and supporting ideas.

E. The activities in "Suggested Reinforcement Activities" are effective practice for the paragraph skills and can be assigned to your students as well.

SECTION 7

DEVELOPING COMPREHENSION SKILLS: RECOGNIZING AND RECORDING COMPLEX INFORMATION

DEVELOPING COMPREHENSION SKILLS/ RECOGNIZING AND RECORDING COMPLEX INFORMATION

In trade and industrial related literature there are large amounts of new information to be learned. Within this information there are logical relationships--classification, comparison and causality. Recognizing these relationships and learning how to record them effeciently for study can be beneficial to the understanding of the material.

The nature of these relationships should be established. Classification in its simplest form is listing. Comparison is the process of finding likenesses and differences. Causality, or cause-effect, is that which results from something else. These will be further discussed, with accompanying examples.

Classification

Classification is a listing of information. The use of classification can be signaled by the following: a colon (:); numbers or letters; words such as "these include." At other times it is simply introduced by a statement: "there are three kinds of joints."

Information which includes classification can be recorded by simple listing if single items are given, or by outlining when items are more complex and require explanation.

Example:

A. Simple Listing

> This is true because (1) the tool may be ground so its side cutting edge is at any desired angle to the shank; (2) the nose

may be ground to any desired radius; and (3) the tool may be set at different angles. (Lascoe, Nelson & Porter, 1973, p. 193)

B. Outlining

CHICKENS

Chickens are classified according to the method used to cook them. There are broilers, fryers, roasters, capons, and stewing hens. Table 4-2 lists the characteristics of each type. Of these, the most important in food service are the fryers.

Pre-preparation of chickens

Broilers. Broilers are halved, each half being a portion. They may also be quartered.

Fryers. Fryers are usually quartered, although in a family-service restaurant each chicken may be disjointed into ten to twelve pieces.

Roasters. Roasters are cooked whole.

Capons. Capons are cooked whole. A capon is a male chicken that has been desexed. It has been especially bred and fattened for roasting.

Stewing hens. Stewing hens are usually disjointed into ten to twelve pieces. The meat is removed after cooking and cut into chunks or diced. (Ray & Dondi, 1980, pp. 88-89)

Table 4-2. Kinds of Poultry

Kind	Age	Weight		Characteristics
		Metric	Customary	
Chickens				
Broiler	8–10 weeks	0.45–1.2 kg	1–2½ lb	Small, no fat, little meat in proportion to bone.
Fryer	14–20 weeks	1.2–1.6 kg	2½–3½ lb	Meaty, thin layer of fat under skin. Fair portion of meat to bone.
Roaster	5–9 months	1.6–2.3 kg	3½–5 lb	Very meaty, excellent layer of fat. Chunks of fat inside body cavity. Good proportion of meat to bone.
Capon (castrated male)	7–10 months	1.8–3.2 kg	4–7 lb	Very meaty, excellent layer of fat. High proportion of white meat.
Stewing hen	Over a year	1.8–2.7 kg	4–6 lb	Heavy, meaty, fat. Large proportion of flavorful, but not so tender, meat.
Turkeys				
Broiler	8–12 weeks	1.4–3 kg	3–7 lb	Little fat. Little meat in proportion to bone.
Roaster				
Hen	3–9 months	3.8–7 kg	8–15 lb	Good layer of fat under skin and well distributed through meat. Smooth skin, flexible breast bone, few pin feathers.
Tom	3–9 months	3.8–11 kg	8–35 lb	Good layer of fat. Rough skin with pin feathers. Good proportion of white meat. Meat may be dry.

(Ray & Dondi, 1980, p. 87)

An outline such as the following could be recorded by the student:

Chickens

I. Pre-preparation
   A. Broilers
      1. halved
      2. quarters
   B. Fryers
      1. quartered
      2. disjointed
   C. Roasters
   D. Capons
   E. Stewing Hens
      1. disjointed
         a. chunks
         b. diced

Modified outline charts can also be constructed for the classification of complex information. Some students prefer the "visual grouping" of the charting procedure, as compared to the written outline. Notice the following example.

Example:

Figure 18: Modified Outline Chart

Cooked Frosting

Fondant	Boiled Frosting	
	Method Number 1	Method Number 2
Ingredients Granulated sugar Water Cream of tartar Method of Cooking 1. Mix the sugar, water, and cream of tartar in a stainless steel saucepan with straight sides to hold the thermometer. Do not use aluminum. 2. Cover the pan and bring the syrup to a boil. Wash down the sides of the pan. 3. Hook the thermometer on the side of the pan and boil to 115°C(240°F) without stirring. 4. Pour syrup into mixer bowl. 5. Place the bowl into a pan of cold water. Cool to 65°C(150°F). 6. Beat the syrup on high speed until it is stiff and white. 7. Knead by hand until smooth.	Ingredients Granulated sugar Water Cream of tartar Egg whites Method of Cooking 1. Follow the directions for making fondant. 2. Place the egg whites in the mixer bowl. 3. Check syrup temperature. When syrup is almost at 112°C(234°F), beat the egg whites until stiff. 4. Pour the syrup in thin stream over the egg whites, beating all the time. 5. Beat until the frosting stands in peaks.	Ingredients Granulated sugar Water Cream of tartar Egg whites Method of Cooking 1. Follow the directions for making fondant. 2. Place the egg whites in the mixer bowl. 3. Start beating the egg whites when the syrup has reached 112°C(234°F). 4. Immediately pour the syrup over the egg whites in a thin stream. 5. Continue beating until frosting stands in peaks.

(Ray & Dondi, 1980, p. 384)

Exercise A: Classify the following information on a separate piece of paper. Construct an outline or an outline chart to record the material which discusses cooking stations.

Flavor of Meats and Poultry

At one time it was thought most of the flavor of meat and poultry came from the lean parts. However, many other factors contribute to it, such as fat, bones, and the method of cooking.

Fat and flavor. The fat of meat and poultry adds much flavor. Very lean cuts or meat from animals with very little fat will not be as flavorful. For the best flavor, the highest quality of meat must have 25 to 35 percent fat, mostly in marbling. Even hamburger needs fat. Government standards allow up to 30 percent.

Cooking and flavor. The flavor of meat and poultry is developed by cooking. Browning enhances the flavor. It also enhances the aroma because the sugar and starch on the surface of the meat caramelizes. Browning sugar and starch is called caramelizing. During cooking, bone also adds flavor to the meat and to the gravey. Meat next to the bone is sweeter and more flavorful.

Exercise and flavor. As an animal exercises, the blood flows into the muscle. This develops a better flavor in the meat. Less tender cuts are more flavorful than tender cuts. This is because they are cut from highly exercised muscles. It is common practice to restrict the movement of animals and poultry while they are being fattened for slaughter. Poultry, especially, are caged almost from birth. To many people, caging animals and birds is inhumane. It should also be noted that caged animals and birds are not as healthy as those allowed freedom of movement. The meat taken from such animals and birds may not be as good for human consumption. Several countries in Europe have outlawed such practices, but they serve the purpose of fast profit.

Feed and flavor. Animals raised on corn have a mild flavor, but range-fed animals develop a stronger taste. Wild animals are gamy. Chickens fed a milk-mash diet will have a more delicate flavor.

> Sex and flavor. Females have a milder flavor than males. Steers are less flavorful than bulls, but the flavor of steers is better liked by most persons. Also, steers give a higher yield in servings per kilogram of meat.
>
> Flavor enhancers. Herbs, spices, salt, vegetables, and fruits are flavor enhancers. They are used to bring out the flavor of meat and poultry and to blend their own flavors with them. Refer to Chapter 6.
>
> As you read in Chapter 6, monosodium glutamate, commonly known as MSG, is a protein salt. It has little flavor of its own. However, when added to meat or poultry, it strengthens the flavor. It is often used in Oriental cooking. (Ray & Dondi, 1980, pp. 175-176)

Comparison

While classification is commonly used in trade and industrial related literature, it is seldom used alone. Once elements of a topic have been classified into sub-topics, these sub-topics are usually compared. The textbook often provides comparison charts in which the topics to be compared are given along one axis and the features of comparison are given along the other. If a comparison chart does not accompany the text information, then a student can construct his own. It is important that the student can understands the organization of this type of chart before he constructs his own. Use a chart such as the following as a model for review by students.

Figure 19: Comparison Chart

Piecrust Formulas

	Flour		Shortening		Water*			Salt	
Type Crust	Metric	Customary	Metric	Customary	Metric	Customary	Percentage	Metric	Customary
70 Percent Shortening Formula									
Long flaky	4.5 kg	10 lb	3.2 kg	7 lb	1.6 kg	3½ lb	35%	165 g	5¾ oz
Medium flaky	4.5 kg	10 lb	3.2 kg	7 lb	1.4 kg	3 lb	30%	155 g	5½ oz
Mealy	4.5 kg	10 lb	3.2 kg	7 lb	1.2 kg	2¾ lb	27.5%	155 g	5½ oz
75 Percent Shortening Formula									
Long flaky	4.5 kg	10 lb	3.4 kg	7½ lb	1.6 kg	3½ lb	35%	165 g	5¾ oz
Medium flaky	4.5 kg	10 lb	3.4 kg	7½ lb	1.4 kg	3 lb	30%	165 g	5¾ oz
60 Percent Shortening Formula									
Mealy	4.5 kg	10 lb	2.7 kg	6 lb	1.8 kg	4 lb	40%	150 g	5¼ oz
50 Percent Shortening Formula									
Very mealy and strong	4.5 kg	10 lb	2.3 kg	5 lb	1.8 kg	4 lb	40%	150 g	5¼ oz

(Ray & Dondi, 1980, p. 348)

This comparison chart is relatively simplistic in which singular items are compared. Students whould then be exposed to comparison of a more difficult nature in which ideas are compared. Note the following chart in Figure 20.

Example:

Figure 20: Comparison Chart

Table 1 Pitch for Various Materials

Stock To Be Cut	Pitch of Blade (teeth per inch)	Explanation
Machine steel cold rolled steel structural steel	14.....	The coarse pitch makes free and fast cutting.
Aluminum Babbitt Tool steel High speed steel Cast iron	18.....	Recommended for general use
Tubing Tin Brass Copper Channel iron Sheet metal (over 18 gage)	24.....	Thin stock will tear and strip teeth on a blade of coarser pitch.
Small tubing Conduit Sheet metal (less 18 gage)	32.....	

(Lascoe, Nelson & Porter, 1973, p. 72)

Example: Next is a comparison chart of ideas (Figure 21) included with the text material explaining those ideas.

A comparison of the scales of the metric system and an understanding of the prefixes will be helpful because the prefixes are used throughout the metric system.

milli - means one one-thousandth of a unit or .001

centi - means one one-hundredth of a unit or 0.01

deci - means one tenth of a unit or 0.10

meter - is the basic unit

Deka - means ten times the unit

Hecto - means one hundred times the unit

Kilo - means one thousand times the unit

Myria - means ten thousand times the unit

In Figure 21 the centimeter scale shows 10 cm. Each of the small divisions is a millimeter: 10 mm. equals 1 cm.

In the inch scale the small units are sixteenths of an inch, and 64 sixteenths = 4 inches. You can see that 10 cm. is nearly four inches.

To facilitate inch and millimeter conversions, remember that 1 inch = 25.4001 millimeters, and 1 millimeter = 0.03937 inch. For example, a self-aligning ball-thrust bearing has an inside diameter of 55 mm. and an outside diameter of 88 mm. The machinist is to turn a shaft to fit the 55 mm. inside diameter. Since American lathes are calibrated in inches, the machinist must convert to the English system. The conversion can be made by multiplying 0.03937 inches/mm. by 55 mm. to get 2.1654 inches. Similarly, the bearing housing will be bored to a diameter of 88 mm. times 0.03937 inches/mm. or 3.4646 inches, plus or minus the necessary tolerance.

Figure 21: Comparison Chart

English and Metric Equivalent Table

English System with Abbreviations	
12 inches (in.)	= 1 foot (ft.)
3 ft. or 36 in.	= 1 yard (yd.)
5½ yds. or 16½ ft.	= 1 rod (rd.)
320 rds.	= 1 mile (mi.)
220 yds. or 1/8 mi.	= 1 furlong
1760 yds.	= 1 mile (mi.)
5280 ft.	= 1 mile (mi.)

Metric System with Abbreviations	
10 millimeters (mm.)	= 1 centimeter (cm.)
10 cm. or 100 mm.	= 1 decimeter (dm.)
10 dm. or 100 cm.	= 1 meter (m.)
10 m. or 1000 cm.	= 1 decameter (Dm.)
10 Dm. or 100 m.	= 1 hectometer (Hm.)
10 Hm. or 1000 m.	= 1 kilometer (Km.)
10 Km. or 10,000 m.	= 1 myriameter (Mm.)

Equivalent Table	
1 mm.	= .03937 in.
1 cm.	= .3937 in.
1 m.	= 39.37 in.
1 Km.	= 0.621
1 in.	= 2.54 cm.
1 ft.	= 30.48 cm.
1 yd.	= .9144 m.
1 mi.	= 1.6 Km.

(Lascoe, Nelson & Porter, 1973, p. 26)

Exercise B:

Construct a comparison chart from the following selection.

TEMPERING

After quenching and before tempering, all tools are in a more or less highly strained condition, and there is often danger of cracking if hardening strains are not promptly relieved. It is good practice not to allow tools to become cold before tempering.

Tempering (often called drawing) consists of reheating tools, which have been hardened, to a comparatively low temperature in order to relieve hardening strains and increase toughness. The temperature varies with the type of steel and the nature of the tool.

Tempering Steel According to Color. Where modern equipment is not available in tempering tools, and old-fashioned method of observing color is still used. The piece to be tempered is hardened in the usual manner and then a piece of emery cloth is used to polish the surface of the steel so that the color variations that occur during the process can be observed readily. The colors progress as follows: faint straw, dark straw, bronze, purple, dark blue, light blue, steel gray. Table 1 shows the color that is used for tempering certain tools and other items.

As an experiment, suppose we polish a sample of SAE 1090 steel which has been hardened to 65Rc (Rockwell) and heat it to 400° F. The oxide coating which forms due to the reaction of oxygen in the air on the iron will be a very light yellow. At this temperature, the hardness will be nearly the same as when fully hardened but the internal stresses in the steel will be relieved.

If we now heat the steel to 450° F, the steel will have an oxide coating that is straw in color. If cooled and then checked for hardness, it will be found that the steel is about 62Rc. It is still very hard but the stresses are further relieved and the toughness of the steel has been increased

When tempered at 500° F the steel will have an oxide coating that is bronze in color and the hardness now is about 60Rc. The part is tougher and has less stresses. At 540° F, the oxide is purple and the hardness is about 55Rc. A temperature of 570° F will produce a dark blue oxide coating and the hardness will read about 50Rc.

In using the temper color method for tempering, care should be taken not to heat beyond the temperature desired. The hardened and polished steel is slowly heated over a fire or any hot medium until the color corresponding to the desired temperature is seen on the polished surface. Cooling may be done in oil or air.

ANNEALING

Tool steel is annealed to soften it for machining, forming, and grain refinement. As processed by the mill, the metal is fully annealed, free from internal stress and of proper hardness for ready machining.

The annealing operation consists of heating the steel to slightly above its critical range and cooling very slowly. In order to avoid excessive scale and surface decarburization, the steel should be packed in a tight container, surrounded by cast iron chips, lime, mica, or any other neutral material. The charge should not be in contact with the container, and the presence of scale should be avoided.

The steel should be heated slowly and uniformly to the annealing temperature range and held within that range long enough for complete penetration of the heat and readjustment of the grain. The length of time will depend on the size of the charge and the alloy content of the steel; 1 to 4 hours is generally sufficient. The steel is cooled slowly, preferably in a furnace. A maximum cooling rate of 50° F per hour down to 1000° F is suggested.

High speed steels are usually annealed at 1600-1650° F, the charge held in that range until uniformly heated through, followed by a slow cool in the furnace for maximum softness. In the packing operation, an excess of carbonaceous packing material must be avoided, as carburizing may occur.

NORMALIZING

> Normalizing consists of heating steel well above its critical range and cooling in air. The purpose of normalizing is to refine the grain and relieve forging strains in those steels that are known to have poor grain structures. In the building of tools, jigs, and fixtures which are of welded construction requiring that close tolerances be maintained, normalizing is necessary before finish machining. (Lascoe, Nelson & Porter, 1973, pp. 474-476)

Cause and Effect

Literature in trade and industrial-related fields frequently teaches students to diagnose and correct common trade and industrial problems. Such discussions are generally written in a cause and effect format. Once again, the making of a chart can facilitate notetaking. In this case, causes are listed in one column, opposite the possible effects. The columns may include categories other than "cause" and "effect" (Ex: "problem, symptoms, treatment")

Exercise C: Suggested Reinforcement Activities/Textbook

Select three sections from the material you will assign to your students in the textbook. These sections must include each of the logical relationships discussed above (classification, comparison, cause-effect). Record the location of each relationship of each section and complete a note chart of each, using given examples as models.

A. Classification

Pg. #	Topic
1.	
2.	
3.	

B. Comparison

Pg. #	Topic
1.	
2.	
3.	

Procedures:

Teaching Student to Recognize and Record Complex Information

Recognizing and recording complex information require higher-level comprehension skills, and are best introduced after the instruction and practice of paragraph comprehension. The three different relationships, together with the notetaking charts, should not be presented simultaneously. Students need to clearly understand the skill of classification, of comparison, and of cause-effect. Each skill with its appropriate notetaking chart should be introduced on a separate day.

With charting, explain that there is a definite relationship presented. This will help the students to recognize how to design the charts and to understand the organization of the material.

Students need to know that one aspect of the relationship makes up one axis of the chart, while another aspect, the other axis.

If your text already presents charts or outlines of these types, the appropriate one should be presented first each day, followed by sample paragraphs or sections from which the students can construct soon as the appropriate text selections are covered.

SECTION 8
DEVELOPING STUDY/READING SKILLS

DEVELOPING STUDY/READING SKILLS

Purpose:

Students of occupational skills need to develop certain study/reading behaviors to get the most from their reading materials. As a vocational teacher you can introduce these study techniques so that students can develop better study/reading habits. The following techniques are not difficult to instruct or to practice, but they will require repetition to be performed well. Some may seem awkward at first because of their newness, but students will become comfortable with them as they practice. When these techniques are used with students' own assigned reading materials, students should be able to see the benefits.

1) The Preview Procedure

A. Previewing the Entire Text

Have the students become acquainted with the total textbook before they begin reading individual chapters. They should be familiar with the overall contents of the book, the organization, and the aids which the author has provided. This would be assigned at the beginning of your course. A suggested format for previewing the entire text is included in Suggested Reinforcement Activities/Textbook in this section. This serves as a practical activity for you and can be used with your students.

B. Previewing the Text Chapter

The technique of previewing is getting an "overview" or a "general idea" of what the reading material is about -- before it is read. Previewing is performed by skimming, or moving the eyes and the mind very quickly over the information. Previewing before reading allows the student to see the big picture, to see what the author is going to discuss, and how the material is organized. Having this information before he/she reads helps the student to have improved comprehension during reading.

Previewing should be done quickly since students are to skim the material -- and not read it carefully. Therefore, students should spend no more than 5 minutes previewing a text chapter by skimming certain highlights the author provided.

To obtain a quick overview, students should use the following guidelines:

Chapter title; illustrations, graphs, etc. plus captions; introduction; conclusion; bold, italicized print; subtitles; questions at the end.

You could initially introduce the guidelines for previewing. Then have the students practice the skill on chapters to be read. Time students for 5-7 minutes. At the end of the time limit, ask students

orally what they found out and discuss as a group, or ask students to write down what they learned about the chapter in those few minutes - words, phrases, names, complete ideas, etc. The recall should be done from memory since this forces the student to be more responsible for the information. As the class practices previewing, they will remember more with the same given time period.

Previewing is a very useful skill, and it does not require additional materials or large amounts of time. As an effective study technique it is largely recommended for classroom use. Students gain much more from their reading when they have ideas of what will be included in their reading than when they read "cold."

2) Reictation

Recitation is an oral or written recall (from memory) of material read. It is a helpful technique for students since it forces them to learn and remember the material rather than to copy it. They will have to assume responsibility for the information since they are working from memory. Benefits of recitation are improved concentration and comprehension.

Recitation can be a short activity of 2-3 minutes or it can last longer -- depending upon the task and the material. At first students will feel awkward utilizing this technique because they have had little practice with writing from

memory. They will become more comfortable and be able to recall more, as this skill is repeated.

Begin small and build. At first have students read 2-3 paragraphs and then write. Gradually increase the amount of reading. Practice this skill with your students throughout the course so that there is development.

The skill of recitation can be used in a variety of ways within your classroom. It is helpful at anytime when you want students to be involved, to learn and to remember material. Possible activities include recitation:

1. after a chapter preview,
2. on an important section of information that needs to be reinforced and remembered,
3. periodically during reading of a text chapter,
4. as a review of class notes,
5. on supplementary material read (manufacturer's materials).

Another positive outgrowth of recitation is the written produce. The students have organized and recorded thoughts on paper and this can be used for study purposes. This makes their time more efficient.

3) The Combination of Reading and Writing

The skills of reading and writing form a strong partnership. When a student reads material to be learned, he/she needs to write it down so that thoughts become organized and the student has a visual mode for commiting the material to memory. We all need to be "involved" as much as possible to acquire and

to learn. Also, when a student writes down what he has read, he becomes aware of what he doesn't know or doesn't understand; he can see the "gaps." This is useful as a study/reading technique.

Involve your students in much writing, and in a variety of ways:

1) Written recitations,

2) Listing of important content vocabulary,

3) Paragraphs using important vocabulary and ideas to be learned,

4) Summaries of information learned about your occupational field from another reading source,

5) Written opinions about concerns and new trends in the occupational field.

In most professional fields, people must write in some form. You can help your students to gain confidence in this skill by giving them lots of practice, and at the same time help them to learn the information more completely.

4) Content Vocabulary Development

As previously mentioned in Developing Vocabulary Skills, "grasping" the content vocabulary is critical to the understanding of the trade and industrial-related occupational literature. Emphasize throughout your course the need for learning the technicla terms. Include them in your class discussions and in your homework assignments. (Refer to the activity suggestions in the vocabulary section of this book.)

5) Effective Reading Technique (Combination of Skills Currently Being Discussed)

We do ask our students to study by themselves because we assume that by this age, they are able to do so. Many individuals, however, have not acquired efficient or useful study skills -- especially for reading textbook chapters.

This section contains a brief overview of a study technique for textbook reading, which was originally devised by Francis Robinson (1970). This technique has defined steps to be done in order, and it is intended to give students opportunity to better read, learn, and remember the information.

A typical procedure for students to use when studying a textbook assignment is to do nothing more than open the book and read the assignment. The more conscientious readers may follow up this initial reading by a second or even a third reading of the same useless type. Research has found a good method for helping the student to read a given selection with better understanding and better recall. It is called the SQ4R method. It involves six basic steps: (1) Survey, (2) Question, (3) Read, (4) Recite, (5) Revise, (6) Review. Each of the steps is discussed under the appropriate headings below:

Survey: (same as preview)

Students use skimming technique to get a general idea of the chapter before it is read. This helps them to concentrate and to feel more involved as they read the chapter. To survey students glance at chapter title, subtitles, graphics, introduction, conclusion, bold and italicized type, questions at the end. Time allowed for survey is approximately 5 minutes.

After surveying, students should write down words and ideas from memory (recitation) -- what they know so far; they can spend 2-4 minutes on this. This helps them to see that they do have information before they begin reading.

(Surveying/Previewing is also discussed in this same larger section of Study/Reading Skills under 1-B.)

Question:

Students need guidelines for their reading. Using the information gained from the survey and the subtitles of the chapter, have students devise 7-8 questions. The questions should pertain to information included in the chapter and ones which they feel will be answered by the author. Questions need not be elaborate; their major purposes are further preparation for reading and something for students to look for as they read. Questions are to be written down. This step should take approximately 10 minutes.

Read:

Keeping in mind the information gained thus far from the survey and question steps, the student begins reading -- looking

for answers to the questions asked, and reading to learn the information. He is reading for important ideas now that he is study/reading. To hold concentration and to get the most out of the reading, encourage students to read for short blocks of time initially and build gradually. Begin with 10 minutes of concentrated reading.

Recite:

After a certain period of reading time, students should stop and write down ideas from memory (recitation). In this recitation they will include any answers to questions that may have been discovered and the important/main ideas of what they have read. This step helps them to learn and remember the information. They should keep the reading recitation with the survey recitation and the questions - so that a written sequence of study is available to them. This step will take 5-7 minutes.

Revise:

To insure accuracy students should open their text and see if they have recorded information correctly. Plus, they may want to make some additions of ideas missed. This step will require 2-4 minutes.

* THE READ, RECITE AND REVISE STEPS ARE THEN REPEATED UNTIL THE CHAPTER IS COMPLETE. IT IS IMPORTANT THAT STUDENTS UNDERSTAND TO REPEAT THESE 3 STEPS ONLY. PREVIEW AND QUESTIONS ARE PERFORMED ONCE PER CHAPTER.

Review:

With this technique students have a written produce to review. They should periodically review the survey, questions, reading recitations and revisions. When chapter is finished they can review the completed written process for their exam.

Benefits of the SQ4R:

1) Students have a written product for review and do not have to reread the chapter 2-3 times.

2) With so much writing students can learn the information more thoroughly.

3) In writing about what they are reading, students can see areas which are unclear and difficult and can seek help.

4) When students change subtitles within a chapter to questions and then read to answer those questions, much more will be obtained than if they merely read and answer questions at the end of the chapter. Students often copy to answer questions assigned. The process of formulating questions is a thinking exercise which "tunes students into the assignment."

5) Recitation (writing from memory) after reading helps students to learn information and they must understand it to write it down -- since they must depend on memory.

Teaching the SQ4R:

1. This procedure requires more time than merely reading a chapter, but the long-term rewards are there. Students do not have to reread chapters, just review certain parts. Also, the written notes can be used for consistent review and cramming the chapter the night before the exam is not necessary. Please emphasize these points with your students.

2. When teaching the procedure, introduce each step adequately. Explain "how" and "why" of each step so students feel comfortable and can recognize the benefits. Do not introduce all six steps at once. For example, on Monday, discuss previewing and practice for 2 days. Then add the question step and practice. Next, introduce the read, recite and revise steps as a unit and assign considerable practice to this. Then the students are ready to do the whole procedure on a chapter they have not read.
3. Use a format for the writing of their information, such as the one in Suggested Reinforcement Activities/Textbook #4. This gives organization to their written notes and definite guidelines for completing the technique.
4. Explain clearly the purpose for utilizing the SQ4R with textbook chapters.
5. Use the suggested time limits when teaching this technique to your students. Encourage them to stick to the time limits when they are working through the SQ4R on their own, since this keeps the system more time-efficient.
6. To be effective, this technique must be practiced over a long period of time. Assign this to be done for much of your reading assignments.
7. Students can work in class and at home with this technique. After the steps are understood, it is a good independent activity.

8. The SQ4R can be used with more than an entire text chapter. It can be used with chapter sections or with occupational handouts. Some adjustment of steps may be necessary - timewise, but the same sequence may be used with most reading materials.

Study Reading Skills

Exercise - Suggested Reinforcement Activities/Textbook

1) A. Previewing the Entire Text

Complete the following information by previewing the textbook which you use in your teaching.

1. Title:
   Author:
   Publisher:
   Copyright Date:

2. What is this book mainly about?

3. Look at the Table of Contents. What major topics are covered in the book?

4. Read the preface or introduction. Briefly, what does it say?

5. What types of graphics are in this text? (diagrams, photographs, charts, drawing, etc.)

6. Is this text well-organized in your opinion? Explain

7. Is this text easy to read or is it more difficult? Why?

8. Does the text have:

Preface or Introduction _____
Table of Contents _____
Index _____
Glossary _____
Chapter subtitles _____
Chapter summaries _____
Activities at end of chapter _____

B. Previewing the Chapter

Select 3 chapters from the text which you use in your classroom. Allow yourself 5 minutes to preview each chapter. At the end of the 5 minutes, write <u>from memory</u> what you learned. For previewing, use the guidelines listed in the discussion of previewing the text chapter (p.).

*Also, try previewing other material which you have not read, so as to fully understand the skills your students will need to use.

Complete the following chart:

Chapter	Words and Ideas from Preview
1.	
2.	
3.	

2) Recitation

Select 4 sections of information throughout your textbook. Begin small (2-3 paragraphs) and gradually increase to a longer selection (2-3 pages). With each selection, read the material, close your book, and record information from memory (main ideas, important facts, vocabulary words). Use the following chart as a model and record the ideas on a separate sheet of paper.

Page #	Recitation (written)
1.	
2.	
3.	
4.	

3) Content Vocabulary

Select 3 introductory chapters from the text you use with your students. List ten content words from each chapter that are essential to know for understanding of the material.

Chapter #	Page #	Content words
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

Chapter #	Page #	Content words
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		
21.		
22.		
23.		
24.		
25.		
26.		

Chapter #	Page #	Content words
27.		
28.		
29.		
30.		

4) The SQ4R Technique

Select a chapter you will assign to your students. Read the chapter according to the designated guidelines. Try to stick closely to suggested time limits. As you work through your chapter, complete the following form. (This same form should be used by students.)

I. Text title:
Chapter title

II. Survey Recitation
(Record from memory what you learned in the survey.)

III. Questions
(Give yourself something to look for in the reading.)

IV. A. Reading Recitation I
(Record from memory what you learned during your first reading.)

B. Revisions

V. A. Reading Recitation II

B. Revisions

VI. A. Reading Recitation III

B. Revisions

*Use own paper if more space for reading recitation and revisions is needed. Do remember to read, recite and revise to the end of the chapter.

Procedures: Teaching Students Study/Reading Skills

Study/reading skills lend strong support to being an efficient student. Practice with them will benefit performance in the trade and industrial-related courses.

The techniques discussed can develop into natural study habits when they are introduced gradually, reinforced strongly and practiced throughout the course. The techniques do not necessarily require extra time, just different procedure.

To become personally familiar with the suggested study/reading behaviors, practice them by completing the activities included in "Suggested Reinforcement Activities/Textbook." When you feel comfortable with the techniques, pass them on to your students. You may use the same activities with them, since the exercises are specific to the skills, but possible for a variety of materials.

SECTION 9
GUIDELINES: MAKING A READING ASSIGNMENT

GUIDELINES/ MAKING A READING ASSIGNMENT

As was discussed earlier, students need guidance to acquire "the most" from a reading assignment. The SQ4R Method was described and recommended as an effective study/reading technique for trade and industrial-related text materials. This method is good for independent student work.

If you have a section of a text chapter, an essay, or a shorter occupational selection that you wish to cover in class as a total group activity, you can use the same procedure, but in an adapted form. Remember that it is important to "direct" the reading assignment; students will gain more, and you will see better results.

The following steps are suggested for directing a reading assignment:

1) Readiness

   A. Ask students questions related to the topic to be read: "What do you know about . . .?" "Have you ever read about . . .?"

   B. Ask students questions concerning personal experiences related to the selection: "Have you ever gone to the dentist and felt fear?" "Explain your ideas about . . . based on your past experience." "As a child did you ever . . .?"

   C. Introduce and discuss vocabulary terms which are important to the understanding of the reading. Place these on the board. Ask students if they know anything about any of the words; this will initiate discussion and you can briefly explain those terms that are totally unfamiliar.

D. Have students preview by glancing quickly over the material to get a general idea of what they will be reading about. Discuss as a group what the preview indicates will be contained in the material.

2) Purpose-Setting

Ask students to read for a specific purpose or purposes. Place a question on the board for them to keep in mind when reading. Looking for specific information will help them to concentrate on the entire reading assignment. Also, ask students to add one or two questions to the purpose-setting, based on their preview and what they feel will be contained in the selection.

3) Silent Reading (Directed Reading)

Students will read the material silently, keeping in mind the vocabulary, the preview, and the purpose-setting. They have been prepared for the reading and now their reading is directed.

4) Purpose Check

Ask students for answers to the purpose-setting questions. This may result in a comprehensive class discussion, in which students ask more questions and misconceptions are clarified.

5) Oral Re-reading

Ask students one or two questions in which the answer needs to be read aloud from the selection. Students will need to skim for the specific answer and this serves as a review. This task is appropriate for concepts which are more difficult and need to be reinforced.

6) Comprehension Check

If there is much information to be learned in your assigned selection you may want your students to answer more questions, written or oral. (In some cases the "purpose check" discussion will be sufficient.)

If you think more feedback is necessary, you can develop different <u>levels</u> of questions to evaluate comprehension.

Examples:

a. Why?
b. How?
c. Opinion question
d. Vocabulary or phrases
e. Completion
f. Essay
g. Inference - not directly stated - "From the selection you can tell . . ."

7) Follow-up Activities

During this step the students are expected to increase their knowledge and use the information gained during the directed reading. Here the students apply the information so that it can be learned and remembered. Suggested activities are:

a. Writing assignment,
b. Further reading in other sources on the same topic,
c. Research project-library,
d. Interviewing a person who is informed on the topic.

Discussion: Helping Students Get More Out of a Reading Assignment

These suggested steps in directing a reading assignment may seem awkward or too time-consuming upon first review. However, the process of preparation through follow-up is sequentially constructed for improved comprehension with a reading selection as a group activity and both you and your students will see the benefits.

SECTION 10
FURTHER SUGGESTIONS: READING SKILLS DEVELOPMENT

FURTHER SUGGESTIONS/ READING SKILLS DEVELOPMENT

There are many components of effective reading skill development. These should be considered when integrating reading skills with the occupational content. This text has covered skill areas of vocabulary, comprehension, and study-reading.

Following are suggestions for certain procedures which can be further beneficial in the instruction of reading skills:

A. Increased Student Responsibility

Skills require practice, and student responsibility in the improvement of the instructed skills should be emphasized. Make extensive outside assignments of the suggested activities introduced in this text, as well as practice in the classroom. Students will be using the occupational materials which you wish them to know, so extra planning for you is minimal. Plus, the "manipulation" of the material through the skill practice will help students to really learn the information required in the trade and industrial field.

B. Evaluation of Activities

With the recommendation of many assigned skill activities, you may wonder how you will grade them. There are ways to give students ample responsibility and avoid the "not enough time to grade" dilemma

1) Not all assignments must receive a letter grade. Some activities are assigned strictly as practice and should only receive a credit grade for completion. The practice, however, should be accompanied with class discussions

of specific guidelines for practicing the skill and of problems which arise as students work with the skills. (Credit Grades: + ✓+ ✓ ✓-)

2) Students, after having guidelines for performing the skills, can work in pairs and evaluate each other's work. Students often encounter the same difficulties and can help each other better understand what to do.

3) Explain to your students that some assigned work is for practice over a period of time and must be compiled as a notebook for a composite grade. Students would begin with the easier skills and build to the more difficult ones -- using the materials which are required for your course. With this, evaluation occurs less frequently.

C. Student Evaluation

Increased student responsibility can also include written evaluation of activity and/or of own performance. Have students evaluate certain units of study or sets of skill activities. Their input can help you to make improvements and to better recognize some of their needs. Set up specific criteria, such as "excellent, very good, satisfactory, unsatisfactory" -- as an overall rating. Then ask for specific comments as to strengths, needed improvements, possible additions, etc. These same ideas can be transferred to a self-evaluation form for performance on an activity or group of activities.

Student evaluation forms can be simplistic so that exact guidelines are known, and so that students feel comfortable with this process. With the evaluations students can have more input into course planning and can become more aware of personal performance.

D. Instructing Skills Together

The major reading skill areas mesh well together, and can be combined effectively in instruction. Vocabulary does not have to be developed separately from comprehension. For example, contextual analysis can be introduced and practiced briefly, and then the main idea could be presented. These two skill areas could be practiced together on the same selection, or could be done on different materials, but within the same selection, or could be done on different materials, but within the same class period.

Vocabulary, comprehension and study/reading skills can be combined throughout your course. Students will be able to see how skills do depend on each other and that reading skill development is a total package -- which should be continued as such.

E. Writing Skills

The importance of increased writing experience has been discussed earlier in "Developing Study/Reading Skills." Writing involves the student more in the material to be learned, helps the student to organize thoughts and to understand and remember the information, and provides practice for a skill which is considered deficient in much of our population. Integrating reading and writing skills should add a well-rounded dimension to your vocational instruction.

A useful activity with writing skills is to have your students write in their own words. Here, the students must understand the material. Repeated practice will enable them to build confidence and to greatly improve their ability to write in their own words.

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